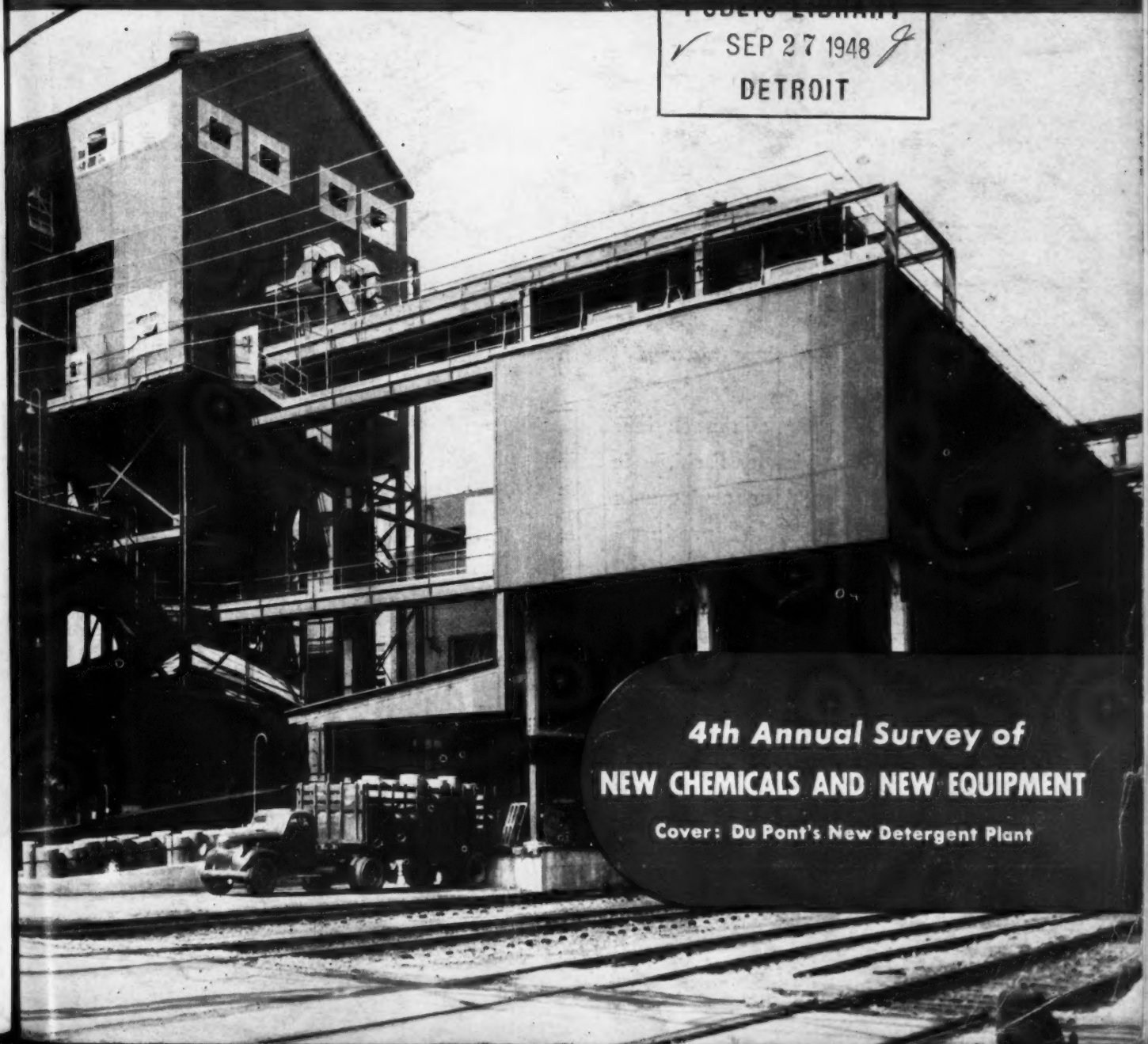
ember 1948

Chemical Industries

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DETROIT



4th Annual Survey of NEW CHEMICALS AND NEW EQUIPMENT

Cover: Du Pont's New Detergent Plant



HOW SOLVAY'S LABORATORY FACILITIES CAN HELP YOU

Manufacturer . . . processor . . . convertor—*everyone* needs help sometimes in overcoming a production problem involving alkalies and associated chemicals. And at such times, SOLVAY Laboratory Facilities may be able to help you find the solution.

SOLVAY Laboratory Facilities include special equipment for serving industries that consume SOLVAY products. This equipment is in almost constant use in connection with our studies of problems from industries such as glass, paper, textile, bottling, sanitation, cleaning and laundry. SOLVAY Laboratory Facilities are intended to supplement the work of your own laboratory . . . and to offer you additional facilities which your technical department may not have.

Should you run into some difficulty in the utilization of our products—don't hesitate to ask SOLVAY TECHNICAL SERVICE for help. If it involves alkalies or associated products, we are ready to serve you! Write us about your problems in strict confidence—there's no cost or obligation.

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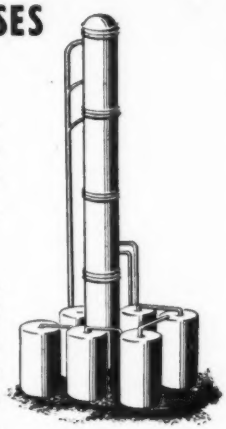
Announcing

SWIFT'S FATS and FATTY ACIDS

for technical uses

Swift & Company is now inviting inquiries on its new lines of fatty acids and fractionated glycerides. Extensive use of solvent processes will make possible new high standards of purity and stability.

1 THE PROCESSES



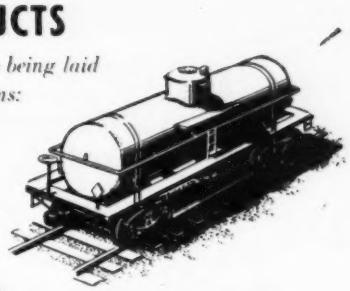
Solvent processes yield fat fractions of higher quality and wider usefulness. Most of Swift's new fats and fatty acids will be processed with solvents.

Unsaturated acids and drying oils will be separated by the Solexol process, using propane as a solvent. Fractions are separated selectively at temperatures not exceeding 200 degrees F. Since thermal and chemical side reactions are thereby avoided, products of greater purity and stability are obtained.

Saturated acids will be fractionated by solvent crystallization. Here, too, processing temperatures are low and harsh catalysts are absent, so that the natural structure of the substances is preserved.

2 THE PRODUCTS

Production plans are being laid for the following items:



Swift's Mixed Fatty Acids
Swift's Cottonseed Fatty Acids
Swift's Animal Fatty Acids
Swift's Linseed Fatty Acids
Swift's Corn Oil Fatty Acids
Swift's Soybean Oil Fatty Acids
Swift's Palm Oil Fatty Acids
Swift's Hydrogenated Marine Oil Fatty Acids

Swift's Fractionated Fatty Acids
Swift's Stearic Acid
Swift's Oleic Acid

Swift's Drying Oils
Swift's Fractionated Sardine Oil
Swift's Fractionated Menhaden Oil
Swift's Fractionated Soybean Oil
Swift's Fractionated Linseed Oil

Other Swift Glycerides
(*now in production*)
Swift's Lard Oils
Swift's Tallow Oil
Swift's Marine Oils
Swift's Neatsfoot Oil
Swift's Sperm Oil

Specialties
(*now in production*)
Swift's Sulfonated Sperm Oil
Swift's Sulfonated Tallow Oil
Swift's Sulfonated Castor Oil (Turkey Red Oil)
Swift's Sulfonated Neatsfoot Oil
Swift's Spermaceti
Swift's Textile Oils
Swift's Anti-foam Agents

3 SWIFT'S TECHNICAL PRODUCTS SERVICE

It brings you:

Representatives who know your problems and requirements.

Product technicians available for consultation on any Swift technical product.

Exploratory research developing products to further increase the efficiency of your operation.



This team is at your service now. Make use of it today!

Address inquiries to:

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INDUSTRIAL OIL DEPARTMENT
Union Stock Yards, Chicago 9, Ill.



...not reserved for our own use!

Just about every ton of heavy chemicals we produce is sold to outside users. And that goes for our recently expanded output, too. So, if you're unable to obtain all the caustic soda, soda ash, bicarbonate of soda, ammonia or liquid chlorine you need, try Mathieson. If you know your long range requirements, see us now about future deliveries.

Mathieson Chemical Corporation,
60 East 42nd Street, New York 17, N. Y.

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Sodium Methylate

ESTABLISHED 1892. PLANTS AT NIAGARA FALLS, N. Y., SALTVILLE, VA., LAKE CHARLES, LA.

Chemical Industries

"SERVING THE CHEMICAL PROCESS INDUSTRIES"

VOLUME 63—NUMBER 3 SEPTEMBER, 1948

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Chemical Industries is indexed regularly by Engineering Index, Inc. and Industrial Arts Index.

Cover: Du Pont Company

PUBLICATION STAFF: Editor, Robert L. Taylor; Managing Editor, Howard C. E. Johnson; Engineering Editor, Herman W. Zabel; Assistant Editor, John J. Craig; Editorial Assistant, Barbara M. Bissell; Contributing Editors, T. Pat Callahan, T. N. Sandifer; Production Manager, Olga E. Vaream. **CONSULTING EDITORS:** Robert T. Baldwin, Lawrence W. Bass, Benjamin T. Brooks, J. V. N. Dorr, Charles R. Downs, Ernest W. Reid, Norman A. Shepard. **BUSINESS STAFF:** Business Manager, W. Alec Jordan; New York, L. C. Todaro, Wm. B. Hannum, Jr., Richard F. Burkhart; Chicago, Frank C. Mahnke, Jr.; Los Angeles, Don Harway; Circulation Manager, Florence Sanders.

Published monthly at 1309 Noble St., Philadelphia 23, Pa., and entered as 2nd class matter July 15, 1944, at the Post Office at Philadelphia 4, Pa., under the Act of March 3, 1879. Subscription $5 a year, $8 for two years, $10 for 3 years. Add $2 per year for postage to Latin America. Other foreign rates, except Canada, $15 one year, $30 for 3 years. Single copies 60c, except special issues. Canadian subscriptions and remittances may be sent in Canadian funds to Chemical Industries, P. O. Box 100, Terminal A, Toronto, Canada. Copyrighted 1948 by MACLEAN-HUNTER Publishing Corporation, 522 Fifth Avenue, New York 18, N. Y., Murray Hill 2-7888. Horace T. Hunter, President: E. R. Gauley, Vice-President and General Manager; J. L. Frazier, Secretary. OFFICE OF PUBLICATION: 1309 Noble Street, Philadelphia 23, Pa. EDITORIAL & EXECUTIVE OFFICES: 522 Fifth Ave., New York 18, Murray Hill 2-7888. DISTRICT OFFICES: Chicago: 309 West Jackson Boulevard, Chicago 6, Ill., Harrison 7890. Los Angeles: 1709 W. 8th St., Los Angeles 14, Calif., Fa-8576. San Francisco: 57 Post St., San Francisco 4, Calif., Yukon 1069. London: Sun Life of Canada Bldg., Trafalgar Square, London, S. W. 1, England.

A MACLEAN-HUNTER publication, Horace T. Hunter, President

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THE READER WRITES

Edwal Making Hydrazine Hydrate

To the Editor of Chemical Industries:

Our attention has been called to an inquiry and a reply concerning hydrazine hydrate on page 344 of the March issue of CHEMICAL INDUSTRIES.

The Edwal Laboratories have been manufacturers of hydrazine hydrate and other hydrazine compounds for the past ten years, and we have from time to time featured this chemical in our monthly advertisement in your publication. It would therefore seem in order that you add our company to your list of sources for hydrazine, and publish a correction to your comment.

W. S. GUTHMANN, President
The Edwal Laboratories, Inc.
Chicago, Ill.

We regret that the name of Edwal Laboratories was inadvertently omitted from the mention of manufacturers of hydrazine hydrate in our March issue. As Mr. Guthmann points out, Edwal made this product long before it achieved its wartime prominence. – ED.

Correction on "Level Measurement"

To the Editor of Chemical Industries:

There was a rather unfortunate error in my article "Liquid Level Measurement in Chemical Processing" that appeared in your June issue. The sentence in the second column, page 925, "The construction and functioning of this unit is much the same as that employed in the Variable Displacement Level Meter considered later in this article," was located in such a way as to appear that it referred to the differential pressure regulators in the air or gas purge system. Actually this sentence refers to the mercuryless differential pressure type flow meter when used for level measurement, as described in the third column, page 925, and should have appeared as a footnote to paragraph three in that column.

S. D. Ross
The Brown Instrument Co.
Philadelphia, Pa.

We regret very much that this error was made in the CI office in the editing of Mr. Ross' excellent article. – ED.



Syntex Patents Owned by Parke-Davis

To the Editor of Chemical Industries:

I read with interest Dr. Howard C. S. Johnson's article regarding Cholesterol in the June issue. May I offer an additional comment to the author's statement that patents are pending in the U. S. on the Syntex process for making synthetic hormones.

Syntex bases their production in Mexico on the well-known Marker patents, which in the U. S. belong to Parke-Davis & Company. In Mexico they belonged to Mr. Marker himself and to those firms to whom he transferred them.

It may be that in addition Syntex has some complementary U. S. patent applications on file.

Dr. F. JONAS
55 West 42nd Street
New York 18, N. Y.

Slips That Get Past

To the Editor of Chemical Industries:

I thoroughly enjoyed your July editorial on "Secrets and Competition."

But are we to attribute the following to the proofreader or to a refreshing facetiousness on the part of the editor: "Industry can grow and develop only through a wide distribution of information about its results. In no other way can it bring so many new *winds* to bear on its problems."

A. E. Boss
Pittsburgh, Pa.

The word was originally written "minds", but the typesetter's "winds" is such an improvement that we hoped by keeping quiet the editor might be credited with great and unsuspected wit and profundity. After all, erosion ought to be a fairly sure – though lengthy – method of disposing of a problem. – ED.

Where, Oh Where Is Wire Cloth Products?

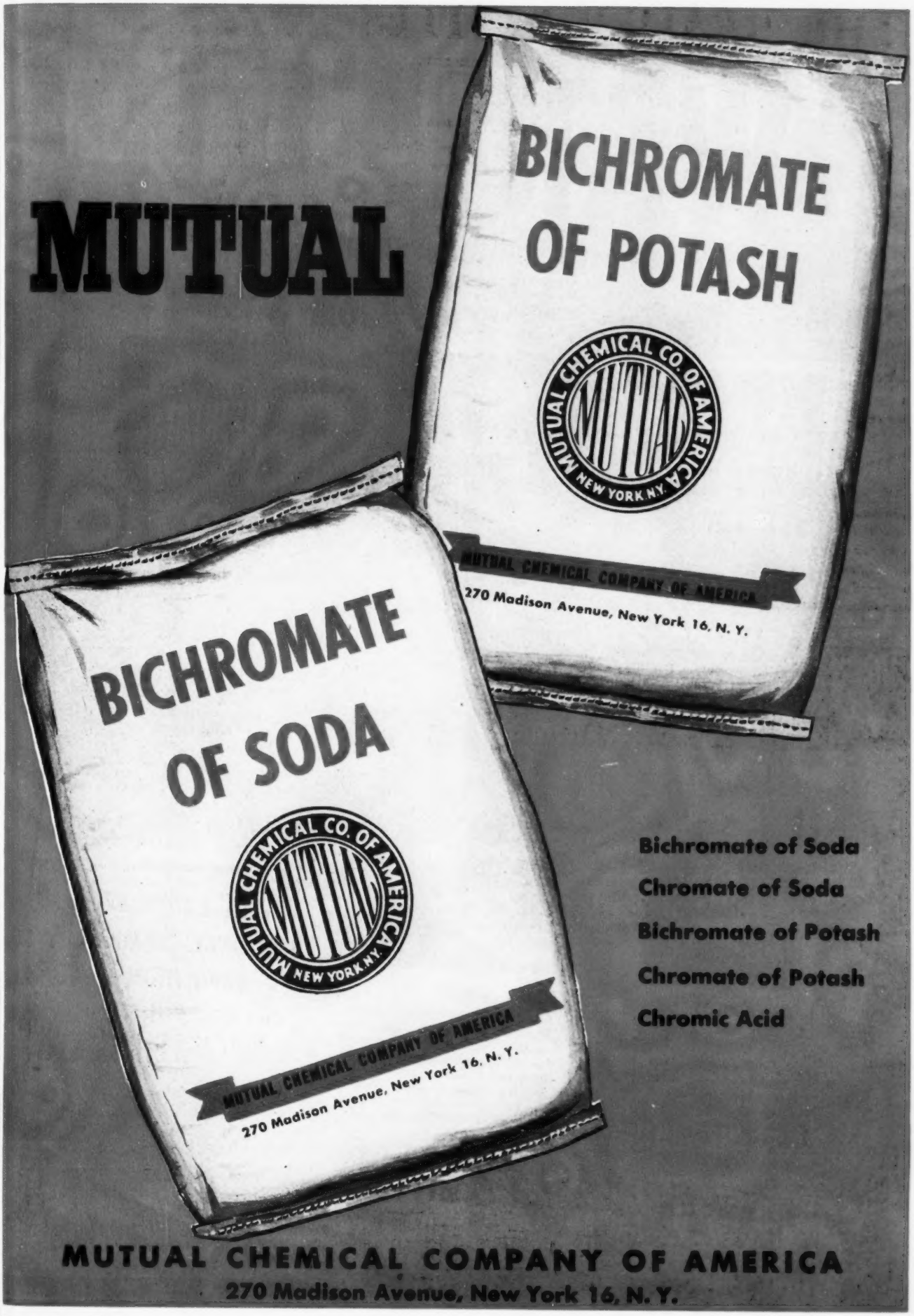
To the Editor of Chemical Industries:

Your July 1948 issue carried a very interesting article on page 26 dealing with distillation column packings produced by Wire Cloth Products, Inc. We have failed to find their address. Can you tell us where we can reach them?

R. L. OLSON
W. C. Hardesty Co., Inc.
Los Angeles, Calif.

A number of people have inquired about Wire Cloth Products' interesting new "wire saddles" tower packing. Sorry we didn't include their address in the article. It is 330 South Michigan Ave., Chicago, Ill. – ED.

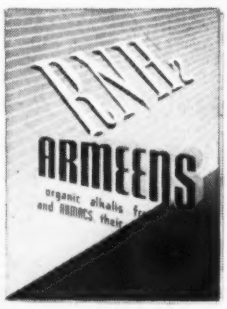
The National Security Resources Board has recommended dispersal of strategic production among communities of not over 50,000 population.


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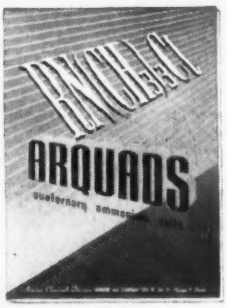
by more and more chemists

ARMOUR'S "CHEMICALS FROM FATS"



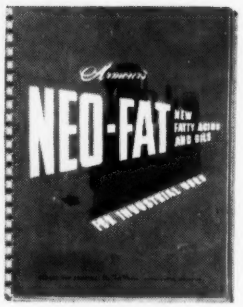
NAME: ARMEENS

Also known as aliphatic amines and their partners the Armacs (amine acetate salts). Wanted for: ore flotation reagents, quaternary salt germicides, cationic emulsification, asphalt bonding, pigment grinding, synthetic detergents, repellents and penetrants. Ask for the useful booklet "RNH_2 . . . Armeens and Armacs."



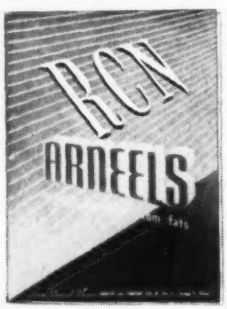
NAME: ARQUADS

Also referred to as Armour's alkyl trimethyl ammonium chloride compounds. Wanted for these uses: germicides, cationic textile softeners, ore flotation reagents, anti-static polishes for waxes, emulsifying agents, detergents and alkaline cleaning compounds. You'll want the booklet "$RN(CH_3)_3Cl$ . . . Arquads."



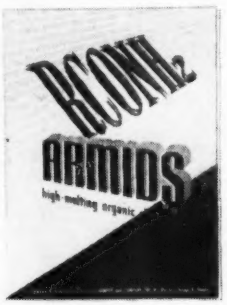
NAME: NEO-FATS

These pure fatty acids, made possible by Armour's patented fractional distillation process, are wanted for: protective coatings, soaps and detergents, rubber compounding, lubricating greases, cosmetics, and chemical intermediates. The helpful booklet "Neo-Fats" gives you more detailed, instructive information.



NAME: ARNEELS

Also called Armour's aliphatic nitriles. Wanted as: lubrication assistants for textiles, water-proofing compounds, softeners for certain synthetic rubbers or elastoprenes and synthetic rubber-like elastics or elastoplastics. Read valuable booklet "RCN . . . Arneels."



NAME: ARMIDS

Alias Armour's aliphatic amides. Wanted for these uses: "all-weather" anti-scratch materials for printing inks, emulsion stabilizers and thickeners, dye solubilizers for carbon paper, anti-blocks for plastics. Ask for the informative booklet "$RCONH_2$... Armids."

For bulletins, samples or additional information on any of these chemicals,

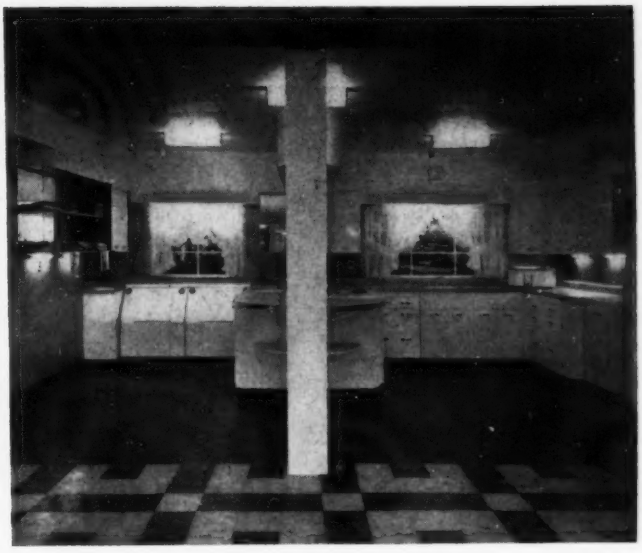
VISIT BOOTH 47
NATIONAL CHEMICAL EXPOSITION
CHICAGO COLISEUM,
OCT. 12-16, 1948

ARMOUR *Chemical* DIVISION

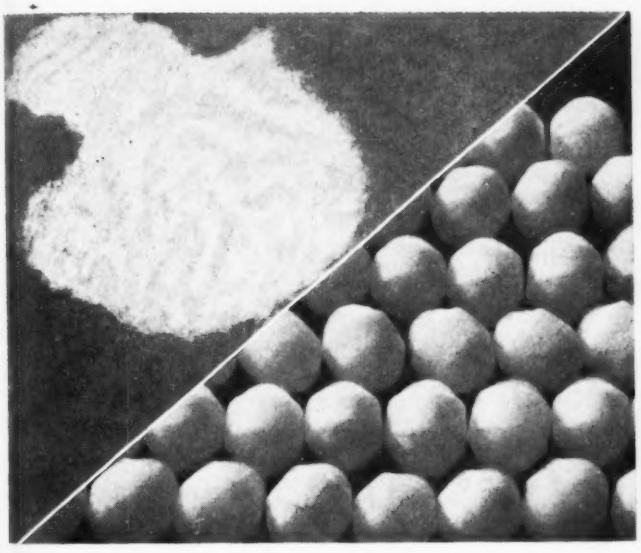
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HOW CAN ISCO PRODUCTS WORK FOR YOU?

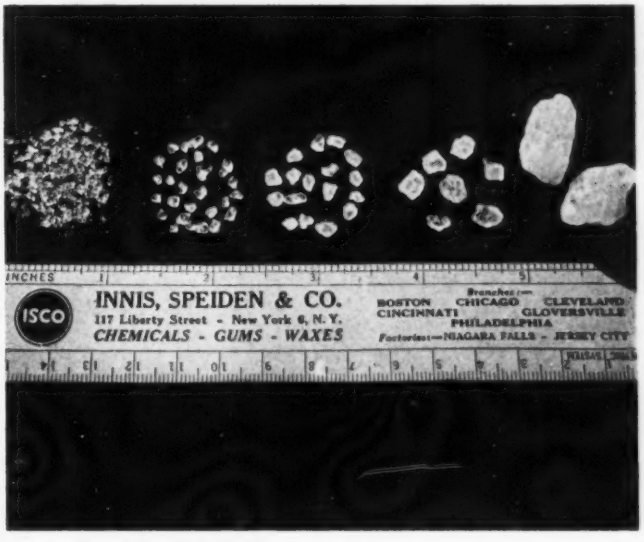
In the Chemical and Allied Industries



SODIUM SILICOFLUORIDE—Na_2SiF_6—White, odorless, amorphous powder. Used in manufacture of porcelain enamels, ceramic glazes, opal glass, artificial marble; ingredient of insecticides; laundry souring agent. Above, as used in porcelain enamels for kitchen cabinets, refrigerators, etc.



NAPHTHALENE—Isco Naphthalene is available in Prime White Chips, bags or barrels; flakes and balls. Bbls. 200 lbs.; also can be supplied in small packages, cartons, etc.



PARADICHLOROBENZENE—Used in manufacture of dyestuffs, intermediates, organic chemicals, insecticidal & germicidal compositions, deodorant, soil fumigant, mothproofing. Available in drums, barrels and kegs. Isco also has naphthalene and orthodichlorobenzene. Above, Para mixed fines; fine crystals; rice crystals; pea crystals; nuggets.

You'll like ISCO operation!

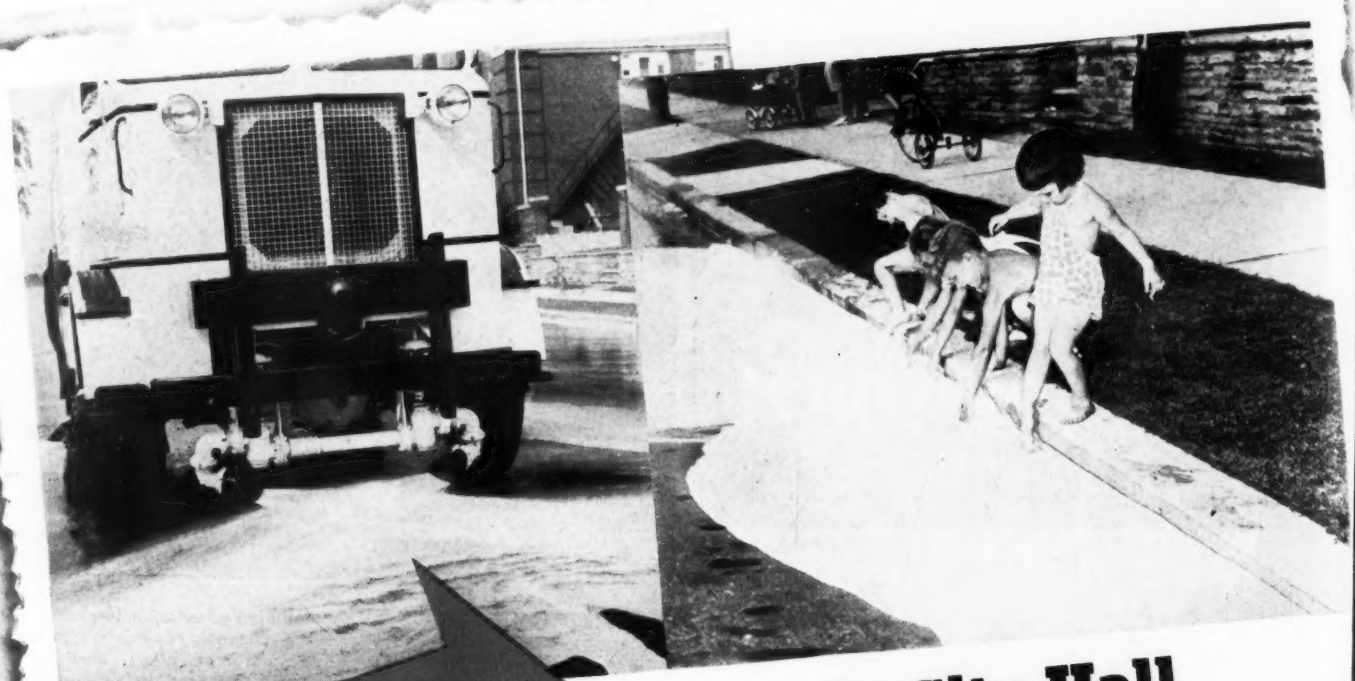
When you call on Isco you can be sure of cooperation from the moment you make your inquiry. You'll like ISCO-operation whether it's a problem of replenishing inventories or a problem of the right material for a new product or process. Our technical department will help you solve any problem involving the use of an Isco product.

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0.03% NACCONOL NR SOLUTION

At City Hall

By FRANK TUMPANE

Bubble Bath Bradley

Bubble-Bath Bradley, Inc., they call him now.

Harold D. Bradley, the ebullient Street Cleaning Commissioner, went right out and gave Bayview Ave. the beauty treatment yesterday He promised he would clear the thoroughfare of dust, grime and oil, and he did.

The big flusher started slowly down Bayview and the nozzles belched the stuff, known as Nac conol. Within feet, the stream o water blew up into bubbles whic turned into suds, which swept th street clean. It foamed in grea mounds upon the curbstones. Som of the mounds were more than foot high.

Children ran to the curb and b gan prancing in the suds wh Commissioner Bradley nodd approvingly. The Nacconol was

THE GLOBE AND M

NACCONOL* NR

AMERICA'S LEADING SYNTHETIC DETERGENT

COSTS LESS THAN SOAP

DOES MORE THAN SOAP

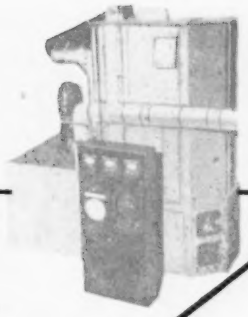
Let us show you how much NACCONOL NR can save on your most difficult washing job.

NATIONAL ANILINE DIVISION • ALLIED CHEMICAL & DYE CORPORATION

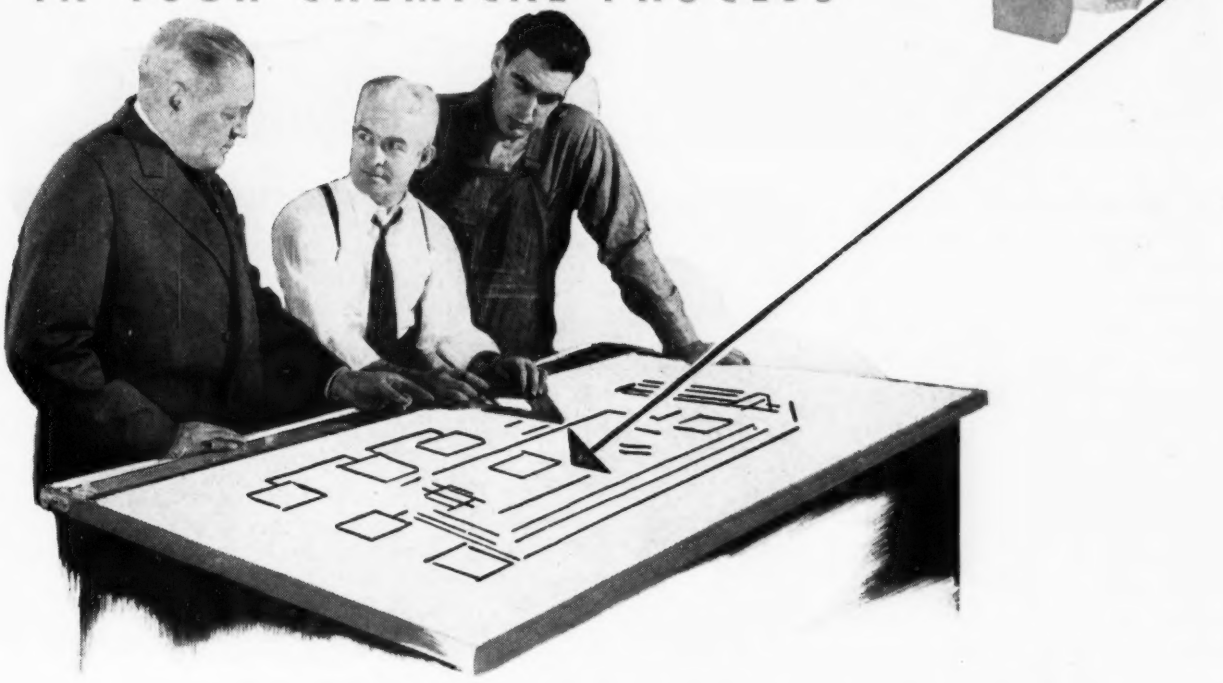
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Precision controlled processing heat up to 1150°F. . . . at low pressure . . . without danger of decomposition, toxic fumes, or flammable liquids—that's the Beth-Tec Unit. A completely automatic heating unit adaptable to chemical processes at efficiencies as high as 65%.

The heat transfer salt for the Beth-Tec Unit is stable, water soluble, and molten at 290°F. It will not creep. Kept molten in a sump tank, it is heated to the desired temperature by means of a water-tube type boiler. Circulation and temperature of the salt are precisely controlled by instruments which reduce manual operation to pushing of an "On-Off" switch. Pressure is only great enough to maintain circulation. When the sump pump is shut off, drainage back into the sump tank is rapid and complete.

Beth-Tec Units are available in models which cover a continuous output range of ¼ million BTU's per hour to 5½ million BTU's per hour. They are supplied with gas or oil fed burners as desired. Sump tanks are available in capacities to meet the needs of any process.

Thoroughly tested in operation, the Beth-Tec Unit can bring precision heat processing in your plant within a price range never before possible for many chemical manufacturers. Contact a Bethlehem Foundry engineer. He has additional information that will interest you. Or, write for our free booklet, "BETH-TEC UNIT."

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BETHLEHEM

Life...on the

EVERY TIME JUMBO WASHES HIMSELF he illustrates the principle of water repellency, which may now be imparted to fabrics by means of PERMEL* Durable Water Repellent Finish—a recent Cyanamid development. PERMEL Finish is good for the life of the garment, lasts through many dry cleanings and washings. PERMEL also makes fabrics resist perspiration stains and water-soluble spots and adds crease resistance. PERMEL is one of a complete line of Cyanamid textile resin finishes for treating wool, cotton and synthetic fibers.





THIS STRONG, MULTI-WALL PAPER BAG was designed and adopted by Cyanamid for the shipment of its CUTRILIN* Bating Compound to tanners who prefer this packing. Advantages ove the conventional wooden barrels include: reduced tare weight and handling costs; ease in handling and emptying; savings in storage space. Outer layer of the bag is wet-strength paper. Thus is the chemical industry providing more efficient packing along with better products.



WHEN WILLIAM HENRY PERKINS, impersonated above, working in his crude attic laboratory in Victorian England, discovered the secret of making aniline dyes, he named his first dye "mauve"—and thus gave a name to a decade. This was fitting, because the discovery revolutionized color itself, which permeates every phase of living. This pioneer in the development of synthetic dyes would be amazed at the progress realized in improving dyes since his day, and the tremendous industry which is devoted solely to producing colors synthetically. The subject makes an absorbing story, and it is told in the 16 mm. sound motion picture "Portrait of an Industry," which Cyanamid's Calco Chemical Division offers for showing to interested groups at no charge. (It's in *color*, of course.)

Chemical Newsfront

GUANYLUREA PHOSPHATE

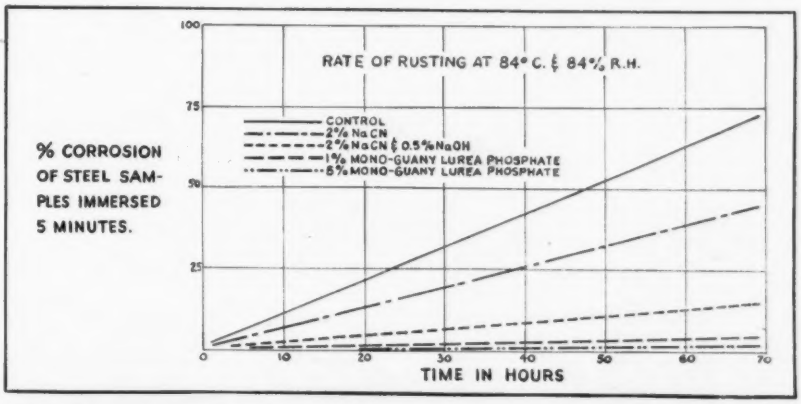
HEADQUARTERS FOR ORGANIC NITROGEN CHEMICALS. AERO† Guanylurea Phosphate is one of many nitrogen derivatives offered by Cyanamid for research.

Properties: White, crystalline solid

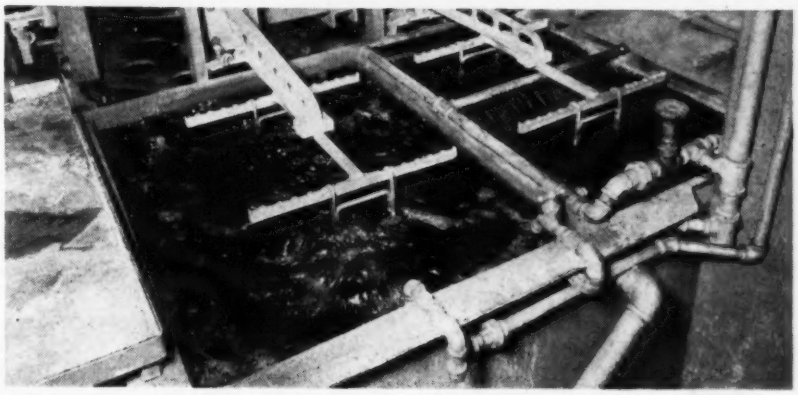
Molecular weight	200
Melting point	185–188° C (decomp.)
pH of 5% H_2O soln.	3.75
Sol. H_2O 25° C	10.3 g 100g.

$$H_2N\text{-}\overset{\overset{O}{\|}}{C}\text{-}NH\text{-}\overset{\overset{NH}{\|}}{C}\text{-}NH_2 . H_3PO_4$$

FOR INHIBITION OF RUSTING. The accompanying chart illustrates the inhibition of the rusting of steel obtained by using 1% to 10% aqueous solution of Guanylurea Phosphate. This compound is very effective without the addition of any accelerators or oxidizing agents. It is sufficient simply to dip the steel for one to five minutes in 1% to 10% Guanylurea Phosphate solution.



AS A METAL CLEANER. When steel rods were allowed to rust under humid conditions in the Cyanamid laboratory, a 10% solution of Guanylurea Phosphate, applied hot, readily removed the rust coating. This property, plus the ability to apply a rust-inhibiting phosphate coating after the rust has been removed makes Guanylurea Phosphate a valuable ingredient of metal cleaners.



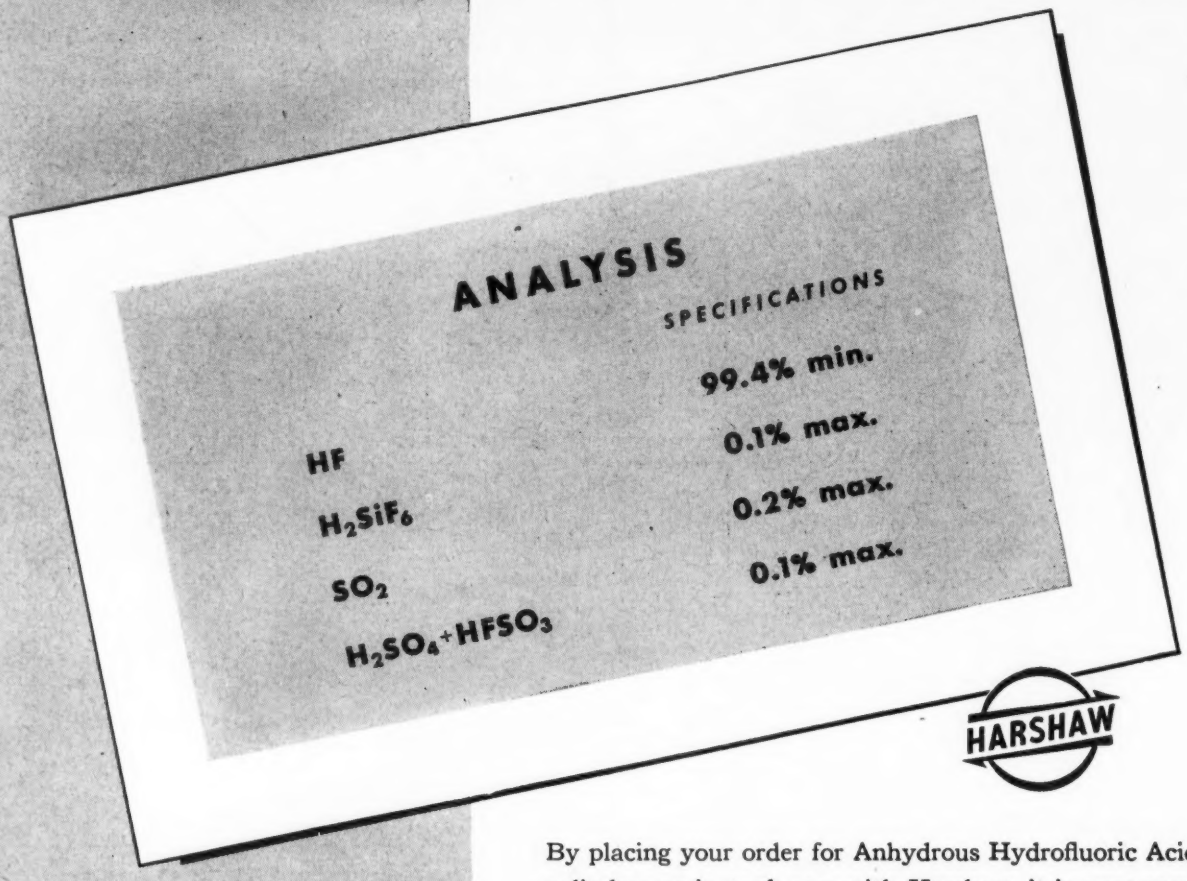
Above applications are but examples of the field opened up by Cyanamid's organic nitrogen chemicals for the development of new products. Descriptive booklets are available. †Trademark *Reg. U. S. Pat. Off.

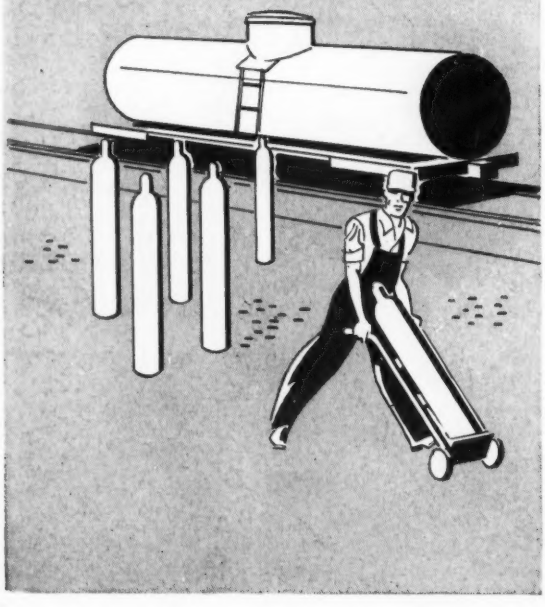
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Guaranteed Specifications..99.4% minimum

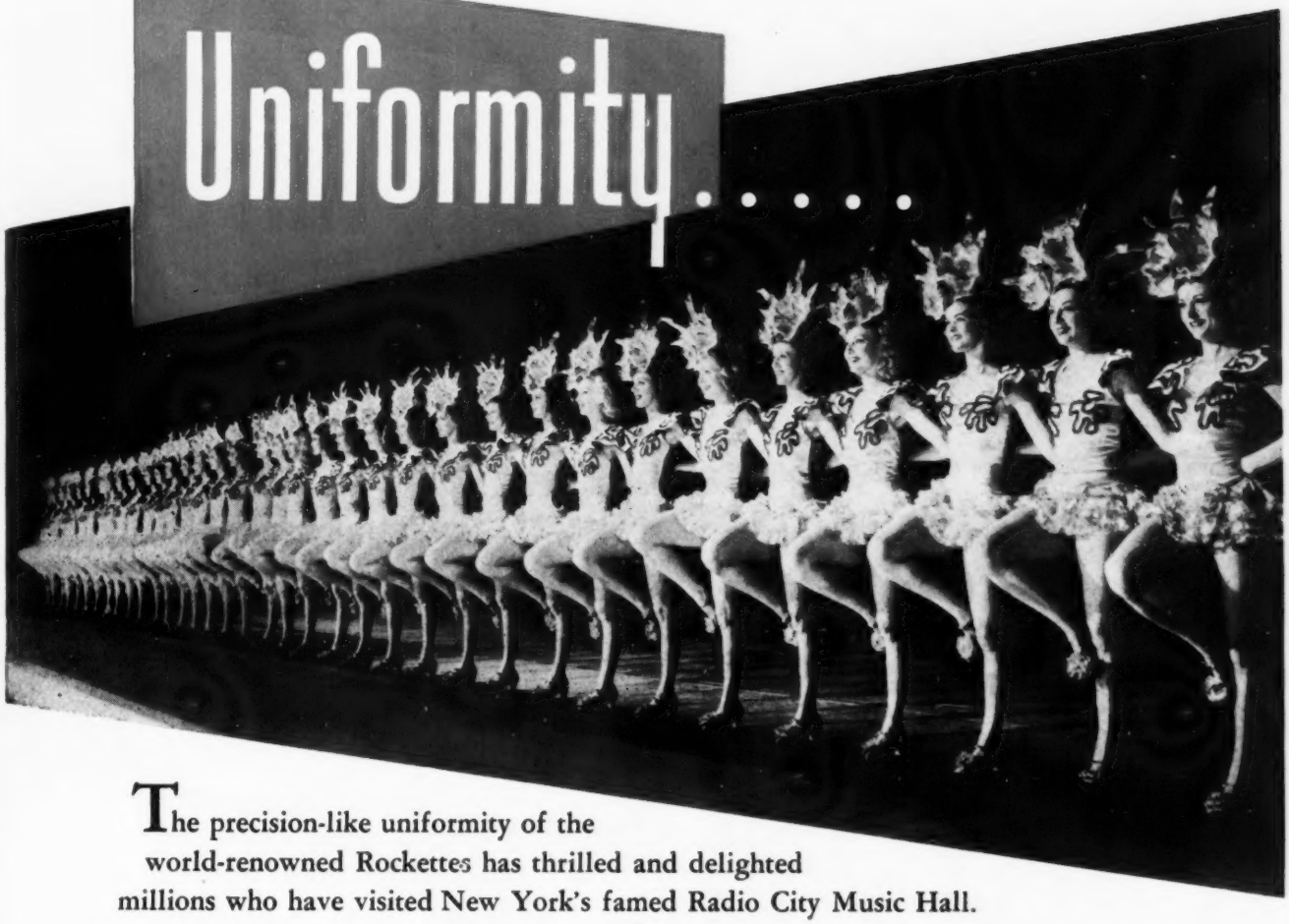




By placing your order for Anhydrous Hydrofluoric Acid in cylinders or in tank cars with Harshaw, it is now possible for you to secure material guaranteed to have a minimum assay of 99.4% Hydrofluoric. This advance in quality over the conventional standard of 99.0% minimum Hydrofluoric has been accomplished at no increase in price. Harshaw's high ranking position as a major producer of Hydrofluoric Acid and Fluoride salts results from a broad knowledge of these products, especially in all phases of their technical applications. The benefit of more than forty years experience is available to you when you order Hydrofluoric Acid and Fluorides from Harshaw.

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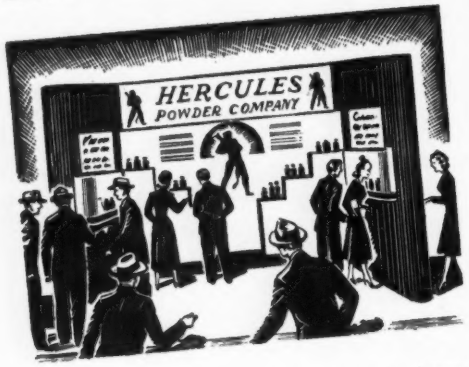
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Creative Chemistry

HELPS THE PROCESS INDUSTRIES

(No. 7 of a Series)

Creative Chemistry at Five Shows



You are cordially invited to review the latest advances in Hercules chemistry at any one of the following five shows. We may have the answers to your product or processing problems.

1948 METAL MINING CONVENTION AND EXPOSITION
Civic Auditorium, San Francisco
September 20-23. Booth Numbers 325 and 327

NATIONAL PLASTICS EXPOSITION
Grand Central Palace, New York City
September 27-October 1. Booth Numbers 38 and 39

15th SOUTHERN TEXTILE EXPOSITION
Textile Hall, Greenville, S. C.
October 4-9. Booth Numbers 331-332

NATIONAL CHEMICAL EXPOSITION
Chicago Coliseum, Chicago
October 12-16. Booth Numbers 36-37

PAINT INDUSTRIES SHOW
The Congress Hotel, Chicago
November 4-6. Booth Numbers 6 and 7

Try Dresinols for Better Latices



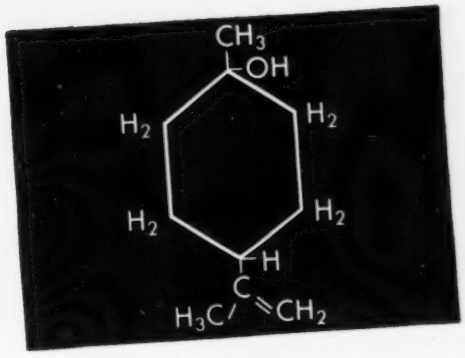
Laboratory tests have proved that Hercules Dresinol* may be effectively combined with synthetic rubber latices in laminating adhesives, paper impregnants, industrial sizings, and pigment binders. Dresinol improves wetting, penetration, speed of tack, binding strength, and adhesion to polar surfaces, such as glass and metal. Latices modified with these low-priced resin dispersions show definite improvement in film properties. Send for data on Dresinols for evaluation with your latex formulations.

Dresinates Clean Cleaner



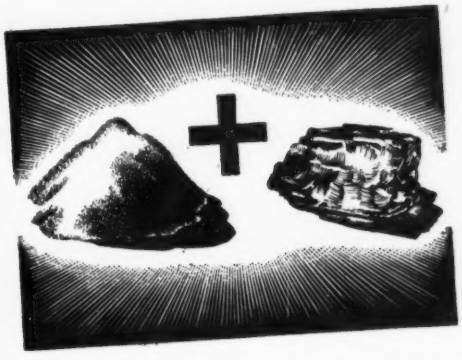
The complex applications of modern, synthetic industrial and household cleaning materials demand the best choice of ingredients to get the best results. Many manufacturers have found that Hercules Dresinates* are an ideal addition to these formulations. Dresinates are the neutral sodium salt of processed rosins. They are compatible with a wide range of synthetic detergents. When Dresinates are used in combination with these synthetics, improved emulsification and dispersing action generally result, and invariably offer a definite price advantage.

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Terpineol* 318, one of a group of Hercules terpene alcohols, is being employed by industry in the synthesis of fine and heavy chemicals—especially where a pleasant smell is desired. Light in color and possessing a mild hyacinth odor, Terpineol 318 is used in making essential oils, disinfectants, soaps, and textile components. It is composed principally of isomeric terpineols which can undergo many chemical reactions. Its boiling point ranges from 217-221°C.

A Perfect Team



Here are two Hercules products that work satisfactorily together in many industrial assignments. A combination of Hercules* Ethyl Cellulose and Hercules Vinsol* Resin, provide tough thermoplastic molding compounds. These two materials also team up well in lacquer, adhesive and laminate mixes. Vinsol is a low-cost, dark-colored resin. Ethyl Cellulose contributes toughness, thermal stability, solubility in a wide range of solvents, low density, and flexibility at extreme temperature ranges.

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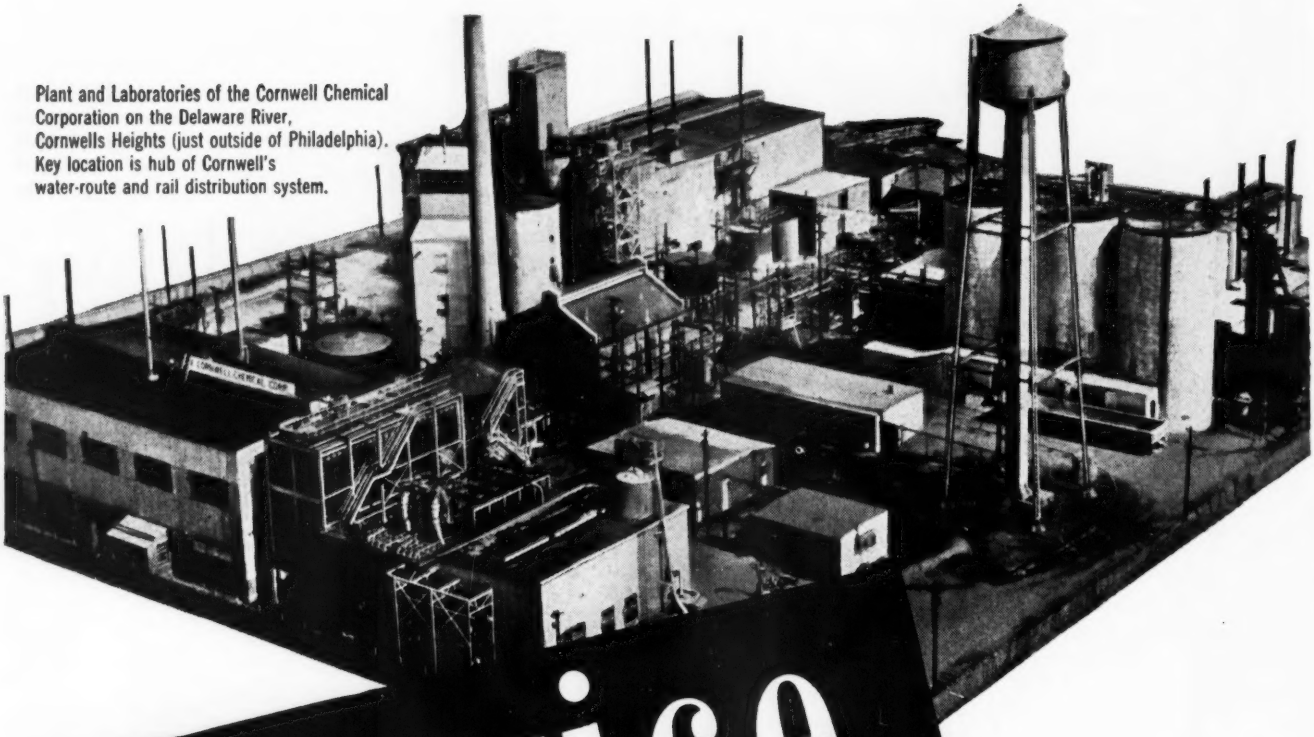
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SHARPLES { MONOBUTYLAMINE $C_4H_9NH_2$ / TRIBUTYLAMINE $(C_4H_9)_3N$

Sharples Monobutylamine and Tributylamine are readily available in commercial quantities. They are versatile chemicals of interest for a variety of applications as listed below:

CURRENT AND SUGGESTED APPLICATIONS

MONOBUTYLAMINE

- Intermediate for:
  - Pharmaceuticals
  - Dyestuffs
  - Rubber Chemicals
  - Emulsifying Agents
  - Insecticides
  - Surface Active Agents

SPECIFICATIONS

Color	Water White
Specific Gravity at 20°/20°C.	0.74-0.75
Acid Insolubles	Not over 0.4%
Butylamine content—at least	96.5%
Distillation:	
Initial boiling point	Not below 73.0°C.
Not less than 95%	Below 81.0°C.
Final boiling point	Not above 85.0°C.

TRIBUTYLAMINE

- Corrosion Inhibitor in hydraulic brake fluid formulations.
- Intermediate for manufacture of rubber accelerator activator.
- Solvent

Color	Pale Yellow
Specific Gravity at 20°/20°C.	0.77-0.79
Acid Insolubles	Not over 0.5%
Tributylamine content—at least	96.5%
Distillation:	
95% between	199-216°C.

We will be glad to cooperate with those who are interested in investigating the applications of these amines. Samples will be furnished at your request.



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* Trademark of Sharples Chemicals Inc.

SHARPLES CHEMICALS INC.

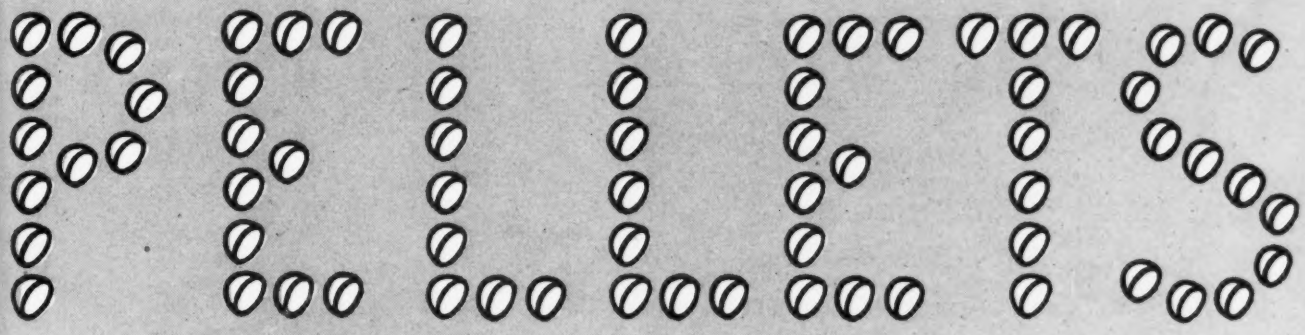
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If you use Sodium or Potassium Hydroxide in C.P. or U.S.P. grades—Baker's Pellets may simplify your handling problems. They're easier to weigh—safer and more convenient to use—higher in chemical purity.

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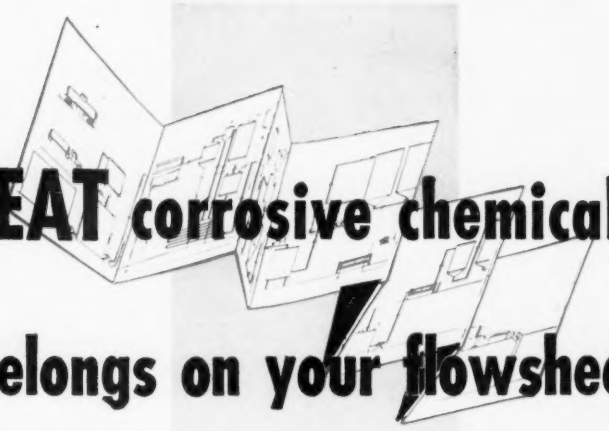


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Durco equipment gives you: The proper alloy . . . the proper design . . . no coating or linings . . . corrosion resistance as thick as the metal itself.

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DURICHLOR—a high-silicon molybdenum iron. For greater resistance to hydrochloric acid and its compounds, especially at higher temperatures and concentrations. Bulletin 50.

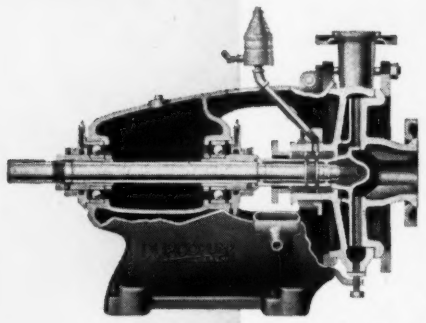
DURIMET 20—a high Ni-Cr-Mo-Cu low carbon stainless steel. For sulfuric and sulfurous acids, oleum, caustic, and other solutions. Bulletin 112.

CHLORIMET NO. 2 — nickel-molybdenum alloy; CHLORIMET NO. 3—nickel-molybdenum-chromium alloy. Chlorimet No. 2 for HCl in all concentrations and temperatures. Excellent for hot H_2SO_4 under reducing conditions and wet hydrogen chloride gas. Chlorimet No. 3 for most acids under oxidizing conditions, various salt solutions, hot sulfuric in concentrations of less than 35%. Bulletin 114.

OTHER ALLOYS — Durco D-10, Monel, Inconel, Pure Nickel, Ni-Resist and Nickel Cast-iron.

WHICH ALLOYS TO USE—*Write for Bulletin 100. It lists 155 corrosives and tells which Durco alloys handle each. For information on specific alloys and equipment, write for the bulletins mentioned above.*

Durco Adv. 69-GM



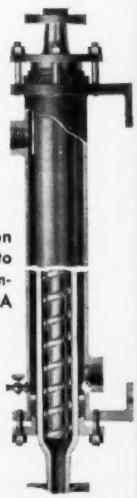
Model 40 Durcopumps. Capacities up to 2,000 GPM; heads as high as 230 feet. Bulletin 815.



Durco Valves are made in a variety of popular types including Y and Angle Valves, Bul. 615, Plug Valves (Lubricated and Non-Lubricated) Bul. 617, 618 and 635, Diaphragm Valves, Bul. 623A.



Durco Split Flanged Pipe — Made in Duriron and Durichlor only. Standard sizes 1½" to 8", Bulletin 704.



Durco Heat Exchangers—Made of Duriron only. Can be set up in series or parallel to handle from 5 GPM to 100 GPM with temperature changes of 300°. Bulletin 1610A and 1611.

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THE DURIRON CO., INC.

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Chemical Industries

THE MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

Newsletter,
September, 1948

For Your Information:

Now in the pilot plant of a large commercial concern is a new fat-from-yeast process. The yeast, isolated from soil by Dr. R. L. Starkey, of the N. J. Agriculture Experiment Station at Rutgers University, is grown on a suitable synthetic medium and consists of over 50% edible fat.

Production of synthetic detergents is resuming its steep upward climb. Members of the Association of American Soap and Glycerine Producers report second-quarter production of 97,000,000 lbs. of synthetics (100% basis), up 40% from a becalmed first quarter. Industry sources estimate AASGP members' output at about 90% of total, thus making yearly domestic production rate over 400,000,000 lbs.--a figure which seemed astronomical only two years ago.

* * CI * *

Chain Belt Co. is busy developing new equipment for dehydration of such heat-sensitive materials as orange juice and coffee. The material is frozen on a moving sheet of stainless steel. The ice is vaporized and the dehydrated concentrate scraped off the sheet by a doctor blade. Quality of the product, the company claims, is superior to that obtained by other drying methods. Cost of drying is expected to be considerably less than with conventional batch freeze-drying.

General Mills' new chemical plant now going into operation at Kankakee, Ill., will concentrate on fatty acid production initially; esters and hydrogenated derivatives will follow shortly. The plant is equipped for the new, continuous high-pressure fat-splitting technique.

* * CI * *

Work is in progress at Monsanto's St. Louis plant toward construction of a Monsanto-Ross-Wilde process unit for sludge acid recovery. The new process, announced last month by Monsanto, yields 98% of the recoverable sulfuric acid in refinery sludge as high concentration sulfur dioxide suitable for contact conversion to acid.

First commercial plant in this country to produce low-priced food yeast (as compared with more expensive brewers' and bakers' yeasts) will start up soon at Rhinelander, Wis. Using the hardy Torula strain

the plant will grow 3,000 tons of dried yeast a year from the waste sulfite liquor of 50 tons a day of pulp produced at the adjacent Rhinelander Paper Co. The plant is owned by Lake States Yeast Corp., a cooperative venture of several Wisconsin sulfite pulp producers. Process is an improved, continuous version of that used in the German Waldhof plants. Output will be used primarily for vitamin and protein enrichment of stock feeds--although a pharmaceutical grade may also be produced.

What is believed to be the first land-based whale-oil processing plant on this continent is being built in the Queen Charlotte Islands by Gordon-Russell, Ltd., of Vancouver. Sharples Corp. is supplying centrifugal separators for the process.

* * CI * *

Hardwood pulping of New England forest stands is moving closer to realization. One firm is now conducting an engineering survey in Connecticut for a 250-tons-per-day mill. Solution of stream pollution problems is claimed, and pulping--because hardwood yields 50% more pulp per cord than softwood--is economical. Although a mixture of soft- and hardwood pulps is produced in this country, straight hardwood pulp is now being made only in France and Sweden.

Engineers are starting to worry about the potential supply of high-performance motor fuels. The use of peroxide-alcohol fuel mixtures--to step up the power of diesel engines and replace superchargers--is being studied by Caterpillar Tractor Co. For gasoline engines, a methanol-water-tetraethyl lead blend has been proposed by Thompson Vita-Meter Corp., Cleveland, as an adjunct to low-octane fuel. Proponents of the fuel say that high-octane values are utilized only a small proportion of driving time. An automobile attachment made by Thompson--to be made available to the public this fall--provides automatic switching to the supplementary high-octane fuel when extra power is needed.

Commercial production of resorcinol by Heyden Chemical Corp. is due in two or three months. Reichhold Chemicals, Inc., incidentally, has also started manufacturing the material at Tuscaloosa, Ala.

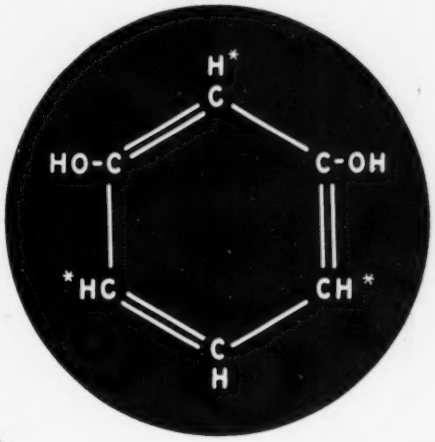
* * CI * *

Here and There:

Ethyl Corp. has joined the ranks of agricultural chemicals producers, has started making benzene hexachloride at its Baton Rouge plant...Tetramethylolcyclohexanol, a new polyfunctional alcohol under development by General Mills, is believed to offer important possibilities as a synthetic drying oil component...A recent patent issued to Sun Oil Co. confirms petroleum companies' interest in chromatographic separation of aromatics (CI, October 1947, p. 629)...University of Minnesota will break ground this fall for a new building to be devoted exclusively to chemical engineering...A million-ton deposit of chemical-grade limestone (99% purity) in Oregon is being developed by Chemical Lime, Inc. Several hundred tons per day production is anticipated.

The Editors





*Positions of greatest reactivity

KOPPERS RESORCINOL

High Reactivity
Great Versatility

Resorcinol is many times more reactive than phenol. Resorcinol undergoes the usual reactions of phenol, and in addition, many unusual reactions of interest. The type reactions shown may suggest useful derivatives to you. (R is used to represent Resorcinol.)

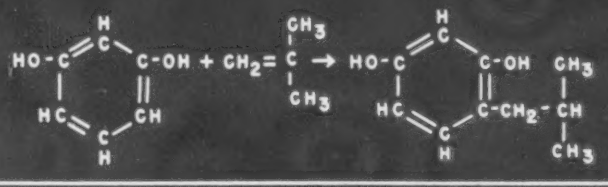
KOPPERS RESORCINOL is supplied in the following grades:

Technical flake . . . 98.5% minimum
U.S.P., crystals . . . . 99.5% minimum

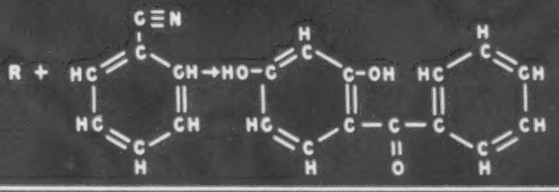
For samples, prices, and additional information write to

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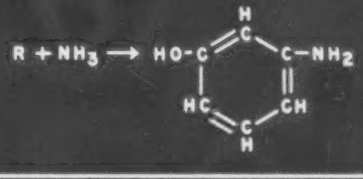
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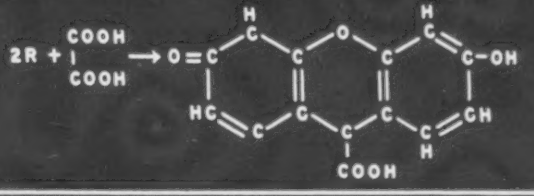
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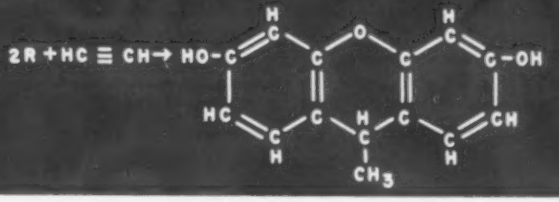
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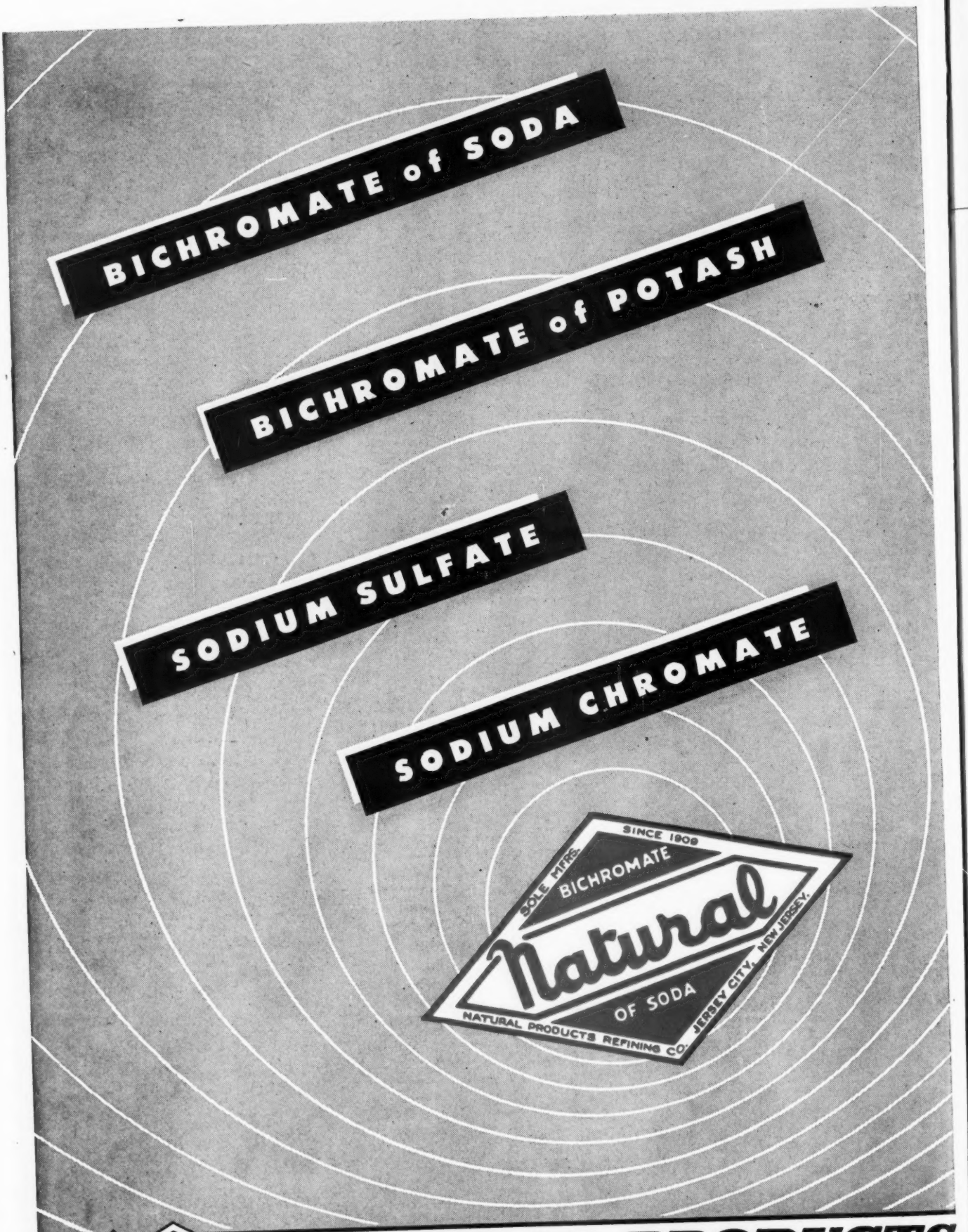
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☐ One 4 oz. sample Resorcinol, Technical.
☐ Bulletin C-8-124 "Koppers Resorcinol."
☐ Bulletin C-8-103 "Products of the Chemical Division."

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NATURAL PRODUCTS REFINING COMPANY

JERSEY CITY, NEW JERSEY

NEW TOOLS FOR PROGRESS

by ***ROBERT L. TAYLOR, Editor***

THE COST OF DOING BUSINESS, like the cost of everyday living, has risen so sharply that companies everywhere are seeking ways and means of conducting their affairs in the most efficient manner possible. As rising costs of men and materials push against stiffening price resistance by consumers, ways of relieving the pressure must somehow be found.

One important way is through the streamlining of plant operations, replacement of old, worn-out equipment with new models incorporating greater efficiency, throughput, or other cost-saving advantages. Another is the use of better or cheaper raw materials and processing materials. Still another is through more economical packaging of product, along with such auxiliaries as automatic filling and handling.

To bring CHEMICAL INDUSTRIES' readers a compact, overall summary of new tools that have been placed on the market in these three major categories during the past twelve months is the purpose of this 4th annual New Chemicals and New Equipment Issue. To be sure that nothing of importance has been overlooked, CI editors have queried makers of chemicals, specialties and processing equipment throughout the nation for information on new or improved products of special interest to the process industries. This information is tabulated and discussed in a special 45-page section in this issue starting on page 378.

A summarization of highlights from each of the four main categories—chemicals, specialties, packaging, and processing equipment—leads off this section, followed by an eight-page discussion of new chemicals and general product trends in the fields of coal-tar chemicals, inorganic chemicals, synthetic organics, naval stores, plastics and high polymers, dyes and pharmaceuticals. Last year there was a slackening of new product announcements in these fields as the backlog of war-shelved projects ran out. This year, however, the first results of postwar research billions seem to be making their appearance and the number of announcements of new chemicals is again reaching new heights.

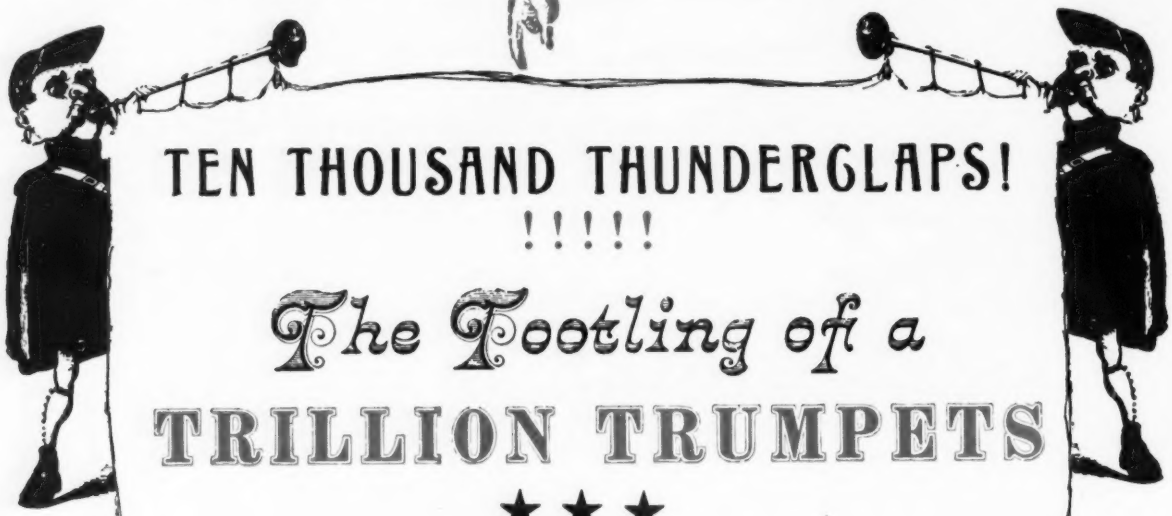
Market growth has also appeared in the field of chemical specialties, to which, because of the broad and important area covered, the editors have allotted equal space with straight chemicals. This category includes both consumer and industrial specialties. It is being increasingly recognized by the larger chemical companies as an expanding field, and a number of them have set up special divisions to handle such products. Smaller organizations devoted exclusively to specialties, traditionally important consumers of basic chemicals, are matching this trend with expanded research activities. The number of new specialty products reported is accordingly substantial.

In the equipment field, no basically new designs have come into prominence during the year, but a large number of improvements and modifications in existing machines will increase their usefulness to the process industries. Delivery dates, too, are much improved as backlogs in most lines dwindle or disappear. Equipment makers are looking forward now to concentrating more on some of the new ideas they have heretofore been too busy to do much about.

Packaging, all too often a neglected stepchild, is coming into its own as container and materials handling equipment manufacturers press educational programs. Many a company has opened its eyes in amazement at the savings that can be realized through good packaging and efficient handling. Indeed, in many plants this field probably offers greater opportunity for streamlining than any other today. Suppliers are meeting their opportunity with a variety of improved packages and handling machinery.

Altogether we believe you will find the array of new chemicals, packages and equipment presented in this issue impressive. We commend it to your study as a source of cost-saving ideas for the months ahead.

CSC MAMMOTH CHEMICAL CIRCUS



TEN THOUSAND THUNDERCLAPS!
!!!!!

The Tootling of a
TRILLION TRUMPETS
★★★
TITANIC
TINTINNABULATIONS

announce the CSC Chemical of the Month

BUTYL STEARATE

STABLE! OLEAGINOUS! COLORLESS! ODOR FREE!

SPECIFICATIONS

Specific Gravity: 0.855 to 0.860 at 25°C./20°C.
Acidity: Less than 0.5%, calculated as stearic acid.
Water: No turbidity when one volume is mixed with 19 volumes of 60° Bé. gasoline at 20°C.

PROPERTIES

Molecular Weight: 340.58.
Distillation Range: 220°C. to 225°C. at 25 mm. of mercury.
Flash Point: 187.8°C. (370°F.).
Weight per U.S. Gallon: 7.14 pounds at 68°F.

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Popular plasticizer for laminated fibers, synthetic rubber, and special lacquers!... Of particular value in polishes and polished coatings! ...Widely-used ingredient of lubricating oils! ... A useful lubricant in textile and molding operations!...An efficient waterproofing agent! ... Imparts smoothness and "feel" to cosmetics and pharmaceutical products!

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COMMERCIAL SOLVENTS CORPORATION
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CSC

What's new

"WASTE" HYDROGEN CHLORIDE?

New chlorine processes attack problem of "waste" hydrogen chloride, may enable soda ash manufacturers to produce chlorine.

APPROXIMATELY 400,000 tons of hydrogen chloride are produced each year as a byproduct in the manufacture of chlorinated and certain other organic chemicals. It has been estimated that a potential of 150,000 tons of chlorine exists in the portion of this total now uneconomically utilized. (CI, p. 583, April, 1948). This is nearly 10% of the total 1947 chlorine production.

Much byproduct hydrogen chloride is now used for the production of ethyl chloride and for acidizing oil wells. Another line of attack on this continually increasing problem, however, is the use of byproduct HCl as a raw material for making chlorine. The pilot plant tests on a new process have been completed successfully and a 25-ton-per-day unit is on the boards. The unit is licensed under the Grosvenor-Miller patent (USP 2,206,399). This process calls for the initial absorption of hydrogen chloride by ferric oxide containing potassium chloride. Chlorine is then generated from the ferric chloride by contacting with air. Potassium chloride is added to prevent the volatilization of the ferric chloride.

The success of this plant may well readjust the economics of the many reactions involving substitution chlorination by reducing their overall chlorine requirements, eliminating the hydrogen chloride disposal problem, and possibly permitting the utilization of certain reactions not heretofore considered economical.

Of even greater potential importance is the possibility of concurrent production of caustic and chlorine via the lime-soda process by operating the Grosvenor-Miller process on the ammonia chloride formed by the double decomposition of salt and ammonium bicarbonate. This may be the means of "regenerating" the competition between electrolytic and lime-soda caustic.

Air Reduction and Solvay

The Grosvenor licensee is not the only party interested in HCl utilization. Before the war, Air Reduction Co. and Solvay Process Co. operated a pilot plant on a new version of the Deacon process (air oxidation of hydrogen chloride in the presence of a catalyst), using what was stated to be an improved catalyst, cupric chloride promoted with uranium or rare earth oxides. This plant has since been dismantled, but T. H. Manninen, who was close to the development, states that in certain areas of the United States the process would be economical not only for waste hydrogen chloride but also for operation on hydrogen chloride produced by the time-honored reaction between salt and sulfuric acid. However, no commercial applications are on the immediate horizon.

Interestingly enough, two of the leading petroleum companies, Esso Standard Oil Co. and Socony-Vacuum Oil Co., possess a number of patents on the production of chlorine from hydrogen chloride, but neither has taken any steps toward their commercial application. Shell has also investigated this method of disposing of waste hydrogen chloride, but at present no action is contemplated.

The Grosvenor-Miller Process

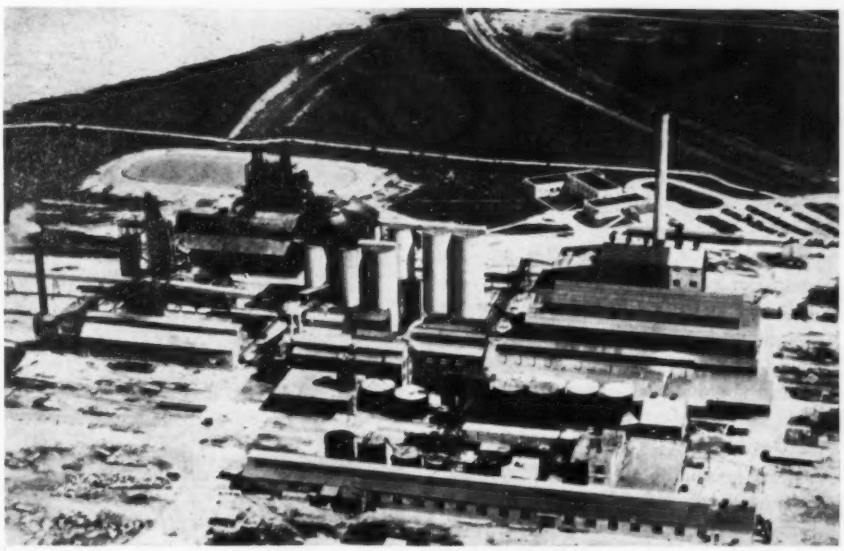
Like the Weldon process, the first used for chlorine production, the Grosvenor-Miller process is a two-step process. In the Weldon process hydrogen chloride is first reacted with manganese dioxide to produce chlorine and manganous cloride. The latter is later reacted with lime to regenerate the manganese dioxide.

Ferric chloride is formed from hydrogen chloride and ferric oxide in the Grosvenor-Miller and Murphree processes. Later contact of the ferric chloride with air regenerates the ferric oxide and forms the desired chlorine. The Grosvenor-Miller process calls upon the catalytic activity of cadmium chloride in this final step. The ferric oxide is recycled.

It is significant that only half of the chlorine charged to the Weldon process is recovered while the newer processes recover essentially 100% of that charged.

Thus the new processes involve the same overall reactions as those employed by the Deacon process and by the Raschig process for the production of phenol via chlorbenzene (CI, Aug. 1948, p. 237).

The Gorin patents (US 2,418,930-1) assigned to the Socony-Vacuum Oil Co., utilize the catalytic agent utilized in the Deacon process but in a two-step manner: Cuprous chloride in the molten condition is first converted to the oxychloride which is then reacted with hydrogen chloride to produce cupric chloride. The cupric chloride is decomposed to form ele-



SODA ASH PLANT: Chlorine too?

mental chlorine and regenerate cuprous chloride for reuse. The volatility of the copper chloride, the catalyst for the original Deacon process, was a major drawback. Presumably this has been reduced in the Gorin process by the addition of an alkali metal chloride to the molten mass.

After the war the Germans were found to be operating a Deacon process chlorine plant utilizing a ferric chloride-potassium chloride catalyst.

Oxygen

Many of the discussions of the potential uses of cheap oxygen have included mention of its possible application for the production of chlorine by the direct oxidation of hydrogen chloride. However, this would require very cheap oxygen, which means extremely large oxygen-producing units. Such volumes probably will never be justified for the production of chlorine alone, as approximately four tons of chlorine can be produced per ton of oxygen. Thus the new plant would require only slightly over six tons of oxygen per day. This is small in the oxygen field, where plants range up to 2,000 tons per day.

There is of course always the possibility of drawing a sidestream of an oxygen plant which has been constructed to supply other operations in the plant, and eventually this may be done.

Lime-Soda Caustic

In its competition for the caustic soda market, the lime-soda process is now on the downswing (CI, p, 583, April, 1948; p. 230, Aug. 1948). This is due primarily to the "oversuccess" of efforts to find a means of disposing of caustic soda's coproduct in the electrolytic process, chlorine. In fact, the aforementioned venture of Solvay with Air Reduction is not Solvay's only effort to produce chlorine without caustic. The company is operating a 70-ton per day chlorine plant at Hopewell, Va. (CI, April, 1948, p. 579) using the reaction between nitric acid and salt (CI, March, 1948, p. 384). However, the market for sodium nitrate appears to be the limiting factor here.

In the ammonia-soda process, huge quantities of ammonium chloride are produced in the step in which ammonium bicarbonate is decomposed with salt. At present the ammonium chloride is decomposed with lime to allow recycling of the ammonia with the resultant production of calcium chloride. Calcium chloride was a waste product for many years, but within the past few years there has been a market for all that can be produced.

According to the Grosvenor-Miller patent ammonium chloride may be substituted for hydrogen chloride in the preparation of ferric chloride in the Grosvenor-Miller process. The ammonia is regenerated as with lime, and can be recycled. The ferric chloride which is formed is decomposed with air in the previously noted manner.

Such a process is of great interest, as it would permit the concurrent production of caustic soda and chlorine. Successful application might again conceivably remake the face of the alkali-chlorine industry.

FREEZE-DRY FRACAS

Validity of freeze-dry patents battled in court. Round one: Lyophile Cryochem's.

THE speed and inconsistency with which the wartime licenses were issued on the freeze-drying patents of the Lyophile Cryochem Corp. resulted in obscurity of both patents and licenses. A step towards clarification was reached on July 30 in the Federal District Court of San Francisco. In a jury trial one of the patents was declared invalid,* charges of infringement of two others† by Cutter Laboratories of San Francisco were upheld. Still another patent, originally involved in the suit, was withdrawn from the adjudication at the behest of Lyophile. Lyophile was awarded $70,922 in damages.

* The invalid patent is generally termed the Barr patent, U. S. 2,353,986, originally assigned Sharp and Dohme Corp.; the withdrawn patent is the Flosdorf-Westin patent, U. S. 2,388,134, originally assigned to The F. J. Stokes Machine Co.

† The infringed patents are the Reichel patent, reissue 20,969, originally assigned to the Sharp and Dohme Corp., and the Flordorf-Stokes patent, U. S. 2,345,548, originally assigned to The F. J. Stokes Machine Co.

At the same time the court held, in deciding a counter-suit by Cutter, that Lyophile had not been improperly using the patents to foster monopolistic practices.

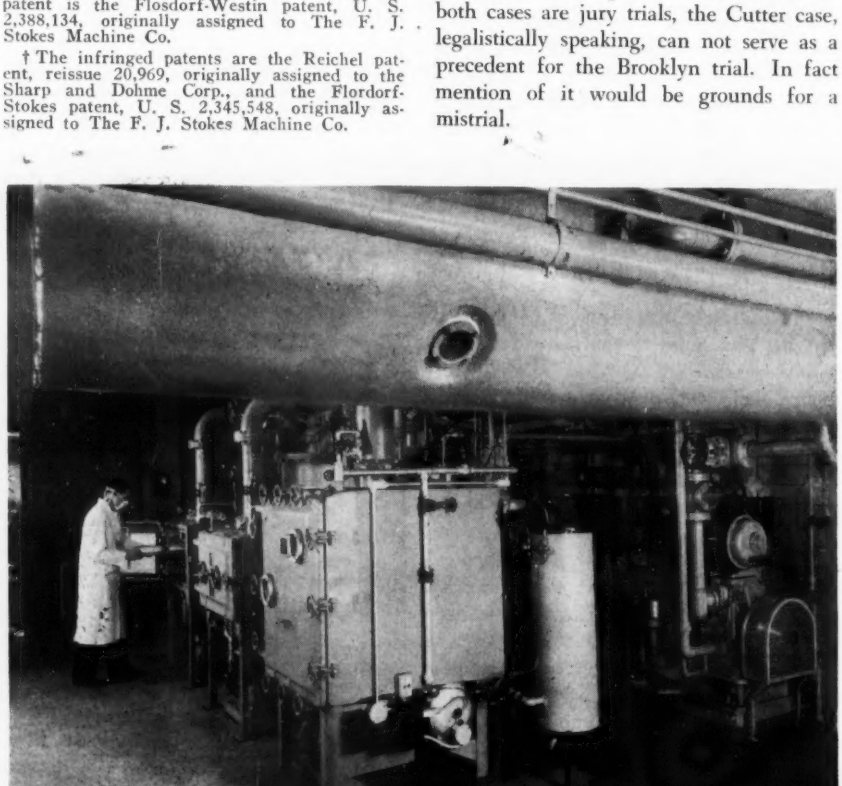
Freeze-Drying

Specifically, the court upheld the right of Lyophile Cryochem to license the process for the production of essentially anhydrous powders from heat-sensitive materials by desiccation in the frozen state under a vacuum. The process was originally developed for the dehydration of serums and other biological materials to allow their easier storage. Thus when penicillin came along, the process was ready and waiting, and was specified for all early plants. Other products now being processed by the "freeze-dry" process under license include streptomycin, vaccines, plasma, and vitamins.

Lyophile has parallel patents granted or pending in eighteen foreign countries, although the applications have been rather strongly challenged in Sweden and Denmark. It is of interest, however, that these latter two countries have turned to the less expensive spray-drying procedures for the drying of plasma and penicillin.

Pfizer

Lyophile has a similar suit against Chas. Pfizer & Co. which is pending in the Federal District Court of New York and is due to come up for trial this fall. As both cases are jury trials, the Cutter case, legalistically speaking, can not serve as a precedent for the Brooklyn trial. In fact mention of it would be grounds for a mistrial.



FREEZE-DRY EQUIPMENT: Invalidity, infringement, and inconsistency.



American Cyanamid Co.

EFFLUENT PLANT: More of these are in the cards.

RIVER RULES

New water pollution act and concerted action by states mean stricter disposal regulations.

SINCE THE TURN of the century, almost as many legislators have professed interest in prevention of stream pollution as have gone on record in favor of motherhood. But in the case of the former, there has been more talk than action in achieving a coordinated national program until two recent events came to pass: the 8-state agreement for abatement of pollution of the Ohio river (Ohio River Compact) was finally signed, and the Barkley-Taft Water Pollution Control Act became a law.

Industrial Responsibility

With the states and federal government joining forces, no industry will escape the responsibility of preserving water resources. Similarly, expenditures that plants have made to control stream pollution in one locality will not be neutralized by uncontrolled dumping in other areas of the watershed. The cost of its share will be no less for the chemical industry than for others. Changes within plants may require reuse of all or part of waste, development of byproducts, changes in processes, or perhaps just more careful operation. Many industrial wastes can be treated with municipal sewage, often after some pretreatment or segregation of portions of wastes within the plant. When this first solution is insufficient, and the second, impractical, plants will have to install their own treating units. Although most plants can get by on sedimentation methods, some types of waste will require development of special processes.

In the past, treatment of industrial wastes has often led to new sources of revenue from byproducts previously dumped into streams. Reuse of waste water, for example, has given the wet miller of corn a valuable feed. The average chemical manufacturer will be happy, however, if he can receive sufficient return from recovered materials to defray part of the cost of the necessary equipment. Such is the case of all but the largest installations in the coke industry where phenols are recovered.

Ohio Compact

The 24 years it took the states of Illinois, Indiana, Kentucky, New York, Ohio, Virginia, Pennsylvania, and West Virginia to get together indicate the varying standards previously set for industry. With the signing of the Compact, they will begin cleaning up streams providing water for 7 million persons and many industries, as well as receiving sewage and complex industrial wastes. Hudson Biery of the Cincinnati Street Railway will head the commission composed of 3 commissioners from each state and 3 from the federal government. It will enact a sewage control program that will cost the public and industry an estimated $400 million.

First Federal Act

Although much improvement has been carried on by states as a result of federal aid, the Water Pollution Control Act is the first federal legislation aimed at reducing pollution of our water resources. Many states have laws covering this problem, but effective control cannot end at state boundaries. The new law will launch a systematic control program with the cooperation of state and interstate agencies by providing financial and technical aid. Offices in each of the 14 major river basins will be the operating centers that carry on necessary investigations.

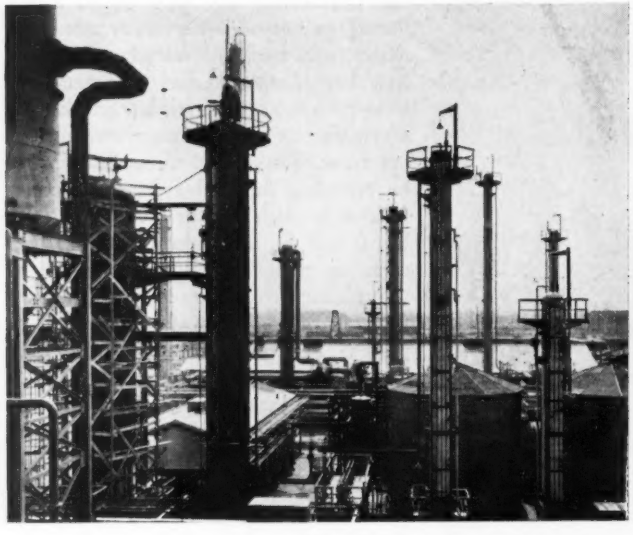
Authorization is given the Surgeon General to make investigations and to prepare and adopt comprehensive programs. An appropriation of $22.5 million can be made for each of the next five fiscal years to aid states in building sewage disposal works. For the same period of time the Act allots one million dollars a year to the Federal Security Agency for research grants. Another million a year is provided for surveys by municipalities preliminary to construction of projects for which loans have been approved. The law, however, goes beyond merely spurring on improvements with financial help: the Surgeon General can order sources of pollution cleaned up, and can institute federal court action.

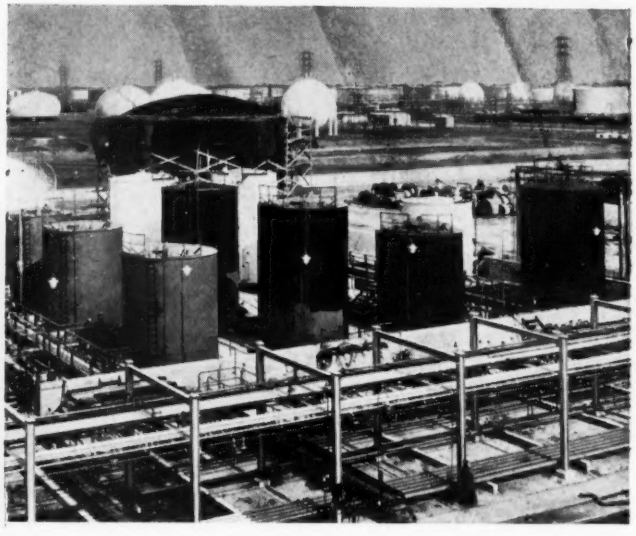
Set-Up

To administer the program, a 10-man Water Pollution Advisory Board will be established in the Public Health Service. It will consist of the Surgeon General or his representative as chairman; one representative each from the Departments of the Army, Agriculture, and Interior, and the Federal Works Agency; and six non-government people to be appointed by the President. A sewage and industrial waste disposal expert, a representative of the wildlife conservation field, a representative of municipal government, a representative of state government, and a representative of affected industry will be in this group. The board will review the policies and program pursued by the Public Health Service under this act, and make recommendations to the Surgeon General.

Many Advantages

Although the initial cost of industry's contribution to the anti-pollution program will be considerable, the long-run benefits will outweigh it. The immediate causes for action—health dangers; objectionable odor, color, or taste of water; loss of recreation facilities; destruction of wild life; and lowering of property values—are obvious. In addition to correcting these conditions, good control will provide plants with a supply of better quality water, and with less expensive transportation as the corrosive action of streams on vessels is checked.





DISTILLATION COLUMNS AND STORAGE TANKS: Hence to alkyds. . . .

GLYCERINE FROM GAS

Shell Chemical Corp.'s petroleum-based glycerine will stabilize prices, encourage new uses.

ALMOST eight years ago, E. C. Williams told the American Institute of Chemical Engineers about Shell's new process for making glycerine from propylene. The research and development work had been successfully concluded by that time; the only obstacle to full-scale plant production was the low market price of 12c a pound for the material.

A lot of water has gone over the dam since 1940. Alkyd resin production has skyrocketed; everything under the sun comes wrapped in cellophane; dynamite and nitroglycerine output has increased. But glycerine produced inched up less than 20 per cent from 1941 to 1947, and the sweet, water-white material has become liquid gold at 40¢ a pound. Shell scurried to build an $8 million plant at Houston, Texas, and this month commercial synthetic glycerine became a reality.

Up and Down, 'Round and 'Round

The price of glycerine has always behaved like a pony on a carousel: in 1926 it hit 32¢; in 1933, 10¢; and in 1937, 29¢; the following year it plummeted down to 12¢. The fairly obvious explanation of this erratic behaviour is that never, until now, has glycerine been produced *per se;* it has always been a by-product of soap and fatty acid manufacture. It has always been there whether anybody wanted it or not. Thus, if there was a pound too little, the price was bid up; if there was a pound too much, the bottom dropped out.

Shell officials figures that an unpredictable price may be preventing new, large-scale uses of glycerine from developing. Reluctance to embark upon a venture using glycerine as a raw material is perfectly understandable, for costs may treble in a year. Neither is there any reason to believe that the price of "natural" glycerine will soon come down, for soap consumption has slipped this year—whether from high prices, the inroads of synthetic detergents, wider use of water softeners, or a simple disinclination to bathe—to the point where soapers' brows are unnaturally furrowed.

The time was ripe for Shell to dig out its ten-year-old data and construct a plant. Although its capacity has not been announced, the statement that by-product trichloropropane will be recovered to the extent of "several million pounds per year" (CI, June 1948, p. 899) indicates a minimum annual glycerine capacity of 20-25 million pounds. (Williams, E. C., *Trans. A.I.ch.E.* 37, 1941, 157.)

Petroleum, Salt and Water

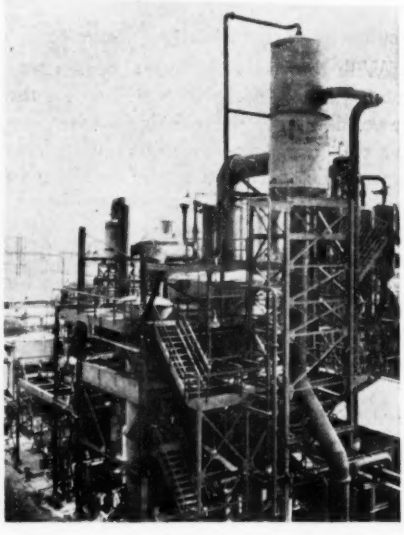
In the Shell process cracked petroleum gases are fractionated to give a high-purity (98 per cent) propylene, 3 to 5 moles of which are preheated to 400° C. and mixed with a mole of chlorine. The heat of reaction raises the temperature of the reactants to 500-530° C., and allyl chloride is formed in yields of 80 per cent or better. The product is purified by fractional distillation.

The allyl chloride can be converted to glycerine by either of two routes: (1) Hydrolysis to allyl alcohol, followed by chlorhydrination to the monochlorhydrin and subseqent hydrolysis. (2) Direct chlorhydrination to glycerine dichlorohydrin, followed by hydrolysis. The second path is indicated by the substantial amounts of byproduct trichloropropane admitted to be potentially available.

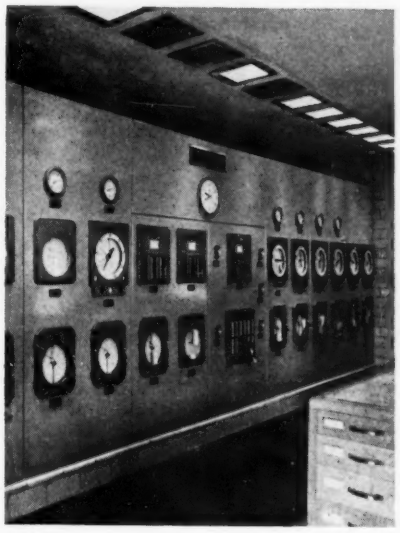
The dilute saline solution of glycerine is concentrated in multiple-effect evaporatores, desalted, and vacuum-distilled to give a product of better than 99 per cent purity. Shell's glycerine can be made to sell profitably, it is believed, in the neighborhood of 25¢ a pound.

Other Syntheses Possible

Shell chose the allyl chloride route only after a thorough examination of other possible means of producing glycerine. Fat-short Germany made 13,000 tons per year during World War I by carbohydrate fermentation; but rectification to high-grade product is expensive and it is necessary to tie in with produc-



PROCESS EQUIPMENT: . . . dynamite. . . .



CONTROL PANEL: . . . . cigarettes. . . .

tion of a considerable amount of alcohol. Hydrogenolysis of sugars—especially glucose—has been patented, but the patents have not been exploited commercially. During the recent war, however, the Germans made "glycerogen," a mixture of about 35 per cent glycerine, 35 per cent glycols, and 25-28 per cent hexitols, by catalytic hydrogenation of sugars at 200° C. and 325 atmospheres pressure. The only plant, that of I. G. Farben at Hoechst, produced 250 tons per month.

Many Large-Scale Uses

Where is all the glycerine going? There are no recent figures, but the Glycerine Producers' Association thinks that the proportions given in the last prewar breakdown (1941) are still valid. Total consumption has risen from 175.1 million pounds that year to 207.7 million in 1947.

Shell believes that its synthetic glycerine—representing an additional, stable source—will tend to level the steel hills and deep valleys of the price curve, encouraging the development of new applications and the growth of old ones.

It is conceivable that the effects will be more far-reaching: Lower glycerine prices will exert an upward pressure on the price of soap and thereby possibly encourage wider use of synthetic detergents. Synthetic glycerine and synthetic detergents together will, in effect, put a ceiling on fats and oil prices. Thus, it is not surprising that the goings-on down in Houston are being followed with keen interest by large segments of the national economy.

COLOR CONSCIOUS

Paint industry woos consumer with "mix-your-own," non-darkening, and one-coat products.

APARTMENT-DWELLERS and homeowners turned weekend-decorators are likely to view the paint industry through paint-smeared glasses—emulsion paint, that is. There are many with such an outlook, as the 1947 sales of twenty million gallons of resin-emulsion paints indicate. Solvent-thinned oil paints, however, are not content to hide their hues under a fresh coat of water-base paint. Lately they have registered gains as emulsion sales have fallen off, and recent developments show that they are out to continue that trend in the interior market. Moreover, they have come up with some new wrinkles in the exterior field where they are still unchallenged.

480 From 5

The Nu-Enamel Corp. of Chicago is offering a new paint that comes in a large enough number of colors (480) to satisfy the most demanding amateur—or professional—interior designer. (Ready-mixed flat paints offer about ten.) The three basic colors—blue, red, and yellow—and the two neutrals, black and white, are all the dealer need stock. To obtain a particular shade, amounts of each color indicated in the dealer's formula book are measured out. After a few seconds' mixing in specially-provided oversized cans, the painter can go to work. If he runs out of material, the same tint or hue can be reproduced without errors caused by variations in physical conditions and psychological factors.

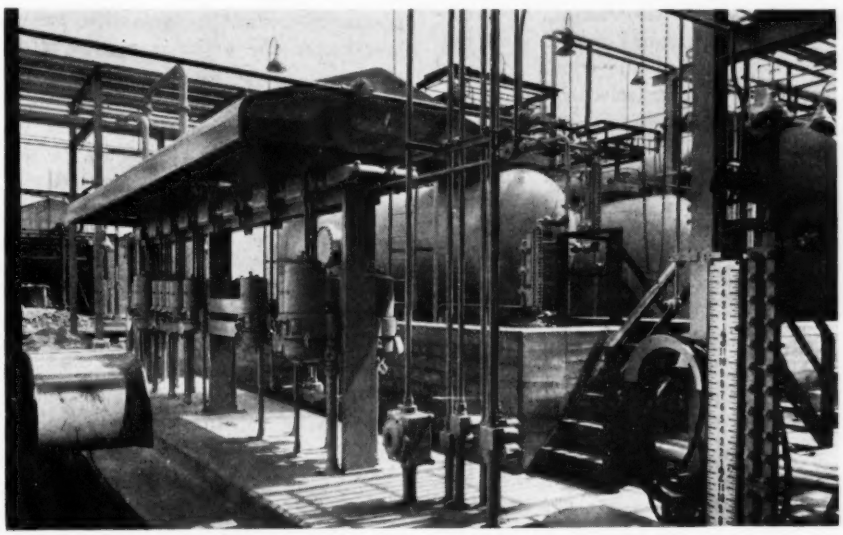
To achieve this color system, Nu-Enamel spent two years learning how to grind primary pigments finer, and incorporate new ones. This has resulted in colors claimed to be many times stronger than conventional ones. Titanium dioxide is the "white," and its presence, along with the grinder, accounts for the good coverage of the paints. Cadmium pigment instead of yellow ochre for the ivories is typical of the pure hues used to give the rich tones characteristic of the paint.

Nu-Enamel will sell the painting public and professional painters through retail outlets. Although at present only flat interior paint is available, later this year semi-gloss and gloss will be added to the line, and eventually, exterior paints.

Such activity in the "color chart" business may be a result of greater consumer demand for pastels that the emulsion people have satisfied, and perhaps, somewhat fired. The consumer is not anxious to buy a standard ready-made green that may be only the nearest thing to what he wants. With more painting chores forced on him, he may take more kindly to mixing in a few basic colors to yield a shade he can live with. Devoe & Raynolds Co. has offered a line similar to Nu-Enamel's for some time—the "Library of Color" that offers 233 tints formulated from flat white and 10 pigments. Sherwin-Williams has had a line for about 10 years which has been marketed on the west coast. Lately it has exhibited some renewed interest in checking on the sales capacity of such products by selling its Decorators' Color Mix in a New York department store.

No Lead At All

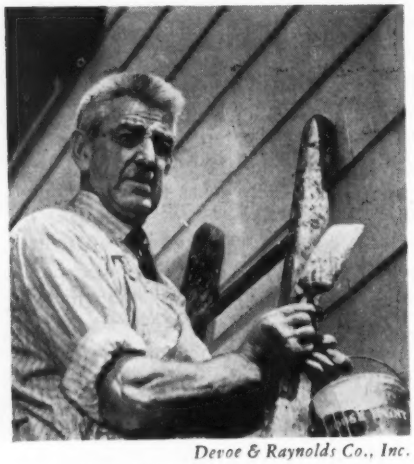
In the exterior field, the first large-scale production of lead-free paint is the Pittsburgh Plate Glass Co.'s latest contribution to the industry. For many years it has been felt that a good outside paint had to be formulated with lead, but titanium pigments have been making inroads since their introduction twenty-five years ago. (White lead has not been in



ELECTRICAL CONTROLS: . . . and cough drops.

many interior paints for some time.) Three years of field-testing in various locations have convinced Pittsburgh that at last it has a lead-free house paint that does a better job than points containing lead.

The company states that shortages of lead and its rising cost have no bearing on the development, which is a natural result of its research program. Fast-drying oils specially compounded with the pigments have resulted in a paint that does not darken in industrial areas as does lead paint under the action of hydrogen sulfide. However, Pittsburgh feels that it has a market in all areas since titanium pigments give better coverage, and a



Devoe & Raynolds Co., Inc.

SUBURBANITE: One's enough.

white that is whiter initially and will stay white longer, than lead paints. It is likely the full line will eventually feature only the lead-free type.

No Second Coat

Another welcome note for the arm-weary suburbanite who hopes that a refurbished exterior will lure the bank into renewing the mortgage on his house has been sounded by Devoe & Raynolds. This month it pulled out all the stops in launching a national advertising campaign for its new one-coat house paint. In four years of field tests, one coat of the new product has proved sufficient in repainting house exteriors.

Emulsion Prospects

While these developments in oil paints are featuring the market scene, work continues in the laboratory on the infant of the industry: emulsion paints.

Surveys have indicated an overwhelming preference for lighter shades, but deeper shades will be manufactured if demand is sufficient. Extension of activity to a greater number of synthetic resins and elastomers and emulsifiers should result in a complete line of water-mixed industrial finishes.

TRAP FOR SMELLS

Tests under way promise elimination of odor exchange between foods stored together.

FOR SEVERAL years housewives have been buying little trade-named canisters of activated carbon to hang in the refrigerator, where they keep the butter from smelling of lemons, and apples from tasting like left-over mashed potatoes.

But the housewives' best efforts are often frustrated by the fact that foodstuffs have already picked up foreign tastes and odors from warehouse storage. Especially in recent years, when the volume of foodstuffs consumed has been higher than ever before, warehouse space has been at a premium. Warehousemen know better, but the exigencies of limited space have forced them to store several commodities in the same room.

Same Principle, Larger Unit

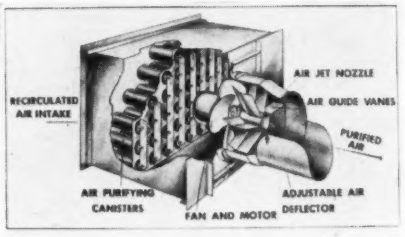
Larger units involving the same adsorption principle—but of carefully engineered design and powered for air circulation—are being tested for warehouse storage. The Refrigeration Research Foundation sponsored a project at Cornell University, learned that activated carbon was by far the best means (better than ozone, activated clays, or aluminasilica gel, for example) of laying odors low. W. B. Connor Engineering Corp. industrial and commercial air purification firm, has installed it for research purposes in several warehouses. In one test 20,000 cases of eggs are involved.

Noses Are Different

Among the odoriferous comestibles studied in the exploratory research at Cornell were apples, onions, eggs, cabbage, potatoes, pears, oranges, and fish. For most of these, the odor level could be measured objectively by passing the contaminated air through ceric sulfate and titrating the extent of chemical reduction. But cabbage and potato odors cannot be measured in this way, so a panel of three judges was used to estimate the levels. They disagreed on many of the "straight" tests, but when highly refined mineral oil was used as an odor absorbent, the judges could get together on the degree of contamination of the oil.

Large Potential

Commercial use of odor-control equipment will become big business, thinks Hugh T. Porter, vice-president of W. B. Connor Engineering Corp. All segments of the food industry are interested in the



AIR PURIFIER: Dungeon for offending molecules.

problem, including the government's Department of Agriculture. The Technical Advisory Committeee, set up under the USDA's Research & Marketing Act, gives top priority to atmosphere-control research.

Warehouses need not be the only beneficiaries: Cargo ships, in which space is even more limited, have even greater need for odor control. The new development cannot be used in ordinary, unattended refrigerator cars; but if mechanical refrigeration is adopted by the railroads (CI, March 1948, p. 387), odor control could also be easily added.

Neither does the development have to be limited to foodstuffs. Odor contamination by or of herbs, spices, various chemicals, and other redolent commodities can be stopped in its tracks as the offending molecules fall into the activated-carbon trap.

ALKALIS STAY HOME

Europe needs soda ash and caustic, but U. S. output won't cover export demands.

BUGABOO of the entire chemical export control program, say officials of the Office of International Trade, is the problem of caustic soda and soda ash exports.

Although actual exports of these commodities represent only a reasonable proportion of production, applications for export exceed the entire domestic production.

For that reason, it is now planned to continue export controls over alkali exports throughout the remainder of this year. Supplies of caustic soda and soda ash are believed adequate for domestic needs, but export supply will remain tight.

As a special act, however, the Government has authorized a supplemental export quota of 4,300 tons of caustic soda for the third quarter to enable the Colorado Fuel and Iron Corp., operating a high-cost Army standby plant at Denver, to dispose of certain stocks now in storage.

The product of this particular plant is necessarily produced at a cost that will not allow its disposal in the home market, according to OIT, leaving the export

market as the logical outlet. However, the Government found it necessary again to waive its new "price-criterion" policy in this case.

Export licensing problems, including suggested new procedures for licensing of alkali export quotas, were the focal points of recent discussions between OIT officials and a 29-member committee drawn from OIT's Alkali Export Advisory Panel.

OIT officials stated frankly that the licensing of caustic soda and soda ash has represented one of the most difficult problems in the entire export control program.

In an effort to solve this recurrent licensing problem, OIT advanced a tentative licensing program for consideration by the Committee. The 6-fold objective was described as follows:

1. To insure that licenses are issued to exporters who would in fact make shipment.
2. To direct the flow of alkali to the most essential uses abroad.
3. To minimize any adverse effect on the domestic market and to reduce the drain on foreign dollar reserves.
4. To assist in the attainment of U. S. foreign policy objectives.
5. To promote foreign trade and the position of the U. S. trader.
6. To provide for adequate distribution of licenses among exporters.

In essense, the proposed licensing plan would provide for an initial screening of all applications to export caustic soda and soda ash, to determine whether all filing requirements had been met, and whether the price was obviously excessive. If, after this initial screening, there remained more acceptable applications than could be satisfied within the quota, exporters submitting such qualified applications would be permitted to submit any additional information which would enable OIT to select for approval those applications which would best satisfy the 6-point policy objective.

Who'll Buy My Chlorine?

A recent report from Austria to this government stressed the growing acute shortage of caustic soda there, necessitating importation to maintain production in the textile and other essential industries.

Austria's problem, which may be a sidelight on other foreign needs, is the economic undesirability of producing caustic soda by the electrolytic process, because there is no home market for by-product chlorine. Formerly Austria exported chlorine to Switzerland, but this market has now waned. Efforts are being made to sell to Belgium. Austria also used the lime-soda process, but this is restricted by the home government in order to conserve soda ash.

SYNTHETIC PAPER

Synthetic resins, substituted for natural fiber coherence, permit paper-making from inferior woods.

NATURE fell down in creating the maple, beech, birch, and poplar. The short fibers of these woods are too independent; i.e., they don't "stick together" with enough tenacity to produce a strong paper.

Now Man's art has remedied Nature's shortsightedness by substituting a synthetic resin for hydrated cellulose, the natural "cement" that holds the fibers together. Commercialization of this discovery can conceivably add to the nation's critical supply of good pulp timber vast amounts of wood which have been of little use in the production of paper.

This new technique, growing out of a comprehensive research program at the National Bureau of Standards on offset printing papers, gives both superior dimensional stability and high strength with the ordinary commercial wood pulps; but, more important, it also enables production of suitable papers from relatively abundant wood species not now fully utilized. The payoff: it doesn't involve any appreciable increase in costs or important changes in manufacturing methods.

Deciduous woods such as the maple, beech, birch, or poplar have until now been used only as "filler" in the manufacture of high-grade printing paper. (In 1946, for example, wood of this type accounted for only 16 per cent of the pulp consumed and in inventory.) No matter how desirable their other characteristics may be, the deciduous woods blush with shame when the primary qualities of strength and resistance to surface "pick" are mentioned. Surface fibers of offset printing papers must resist the pull necessary to transfer tacky ink from a rubber blanket to the paper without lifting or being themselves transferred to the blanket. A fiber or bundle of fibers loosened by the pull of the ink not only leaves a blemish in the printed image on the sheet where the "picking" occurs, but it may cling to the blanket where it becomes moistened, repelling the ink so that it prints white spots on succeeding sheets. The development of strength through the use of the synthetic resin, melamine formaldehyde, can materially increase the use of the short-fibered pulps.

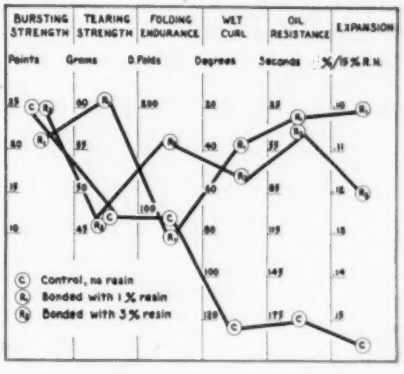
How It Works

Paper is a felted sheeting of vegetable fibers, which are prepared for fabrication by mechanical beating in water. Beating causes the fibers to hydrate and form a gel-like film on their surfaces. This gel bonds the fibers together to give conventional paper its strength. Although the beating process has been necessary to provide sufficient fiber bonding for certain printing requirements, it also begets a lot of headaches: high expansion, excessive curling, slow oil absorption, show-through of images.

Bureau of Standards simply substitutes synthetic resin bonds between the fibers for the gel-like bonds formed by hydration. The resin bonding gives optimum strength with only a fraction of the beating required in the absence of resin, and by obviating the adverse effects of hydration, it produces a superior paper. It is this feature of resin bonding that makes strong paper from deciduous pulps.

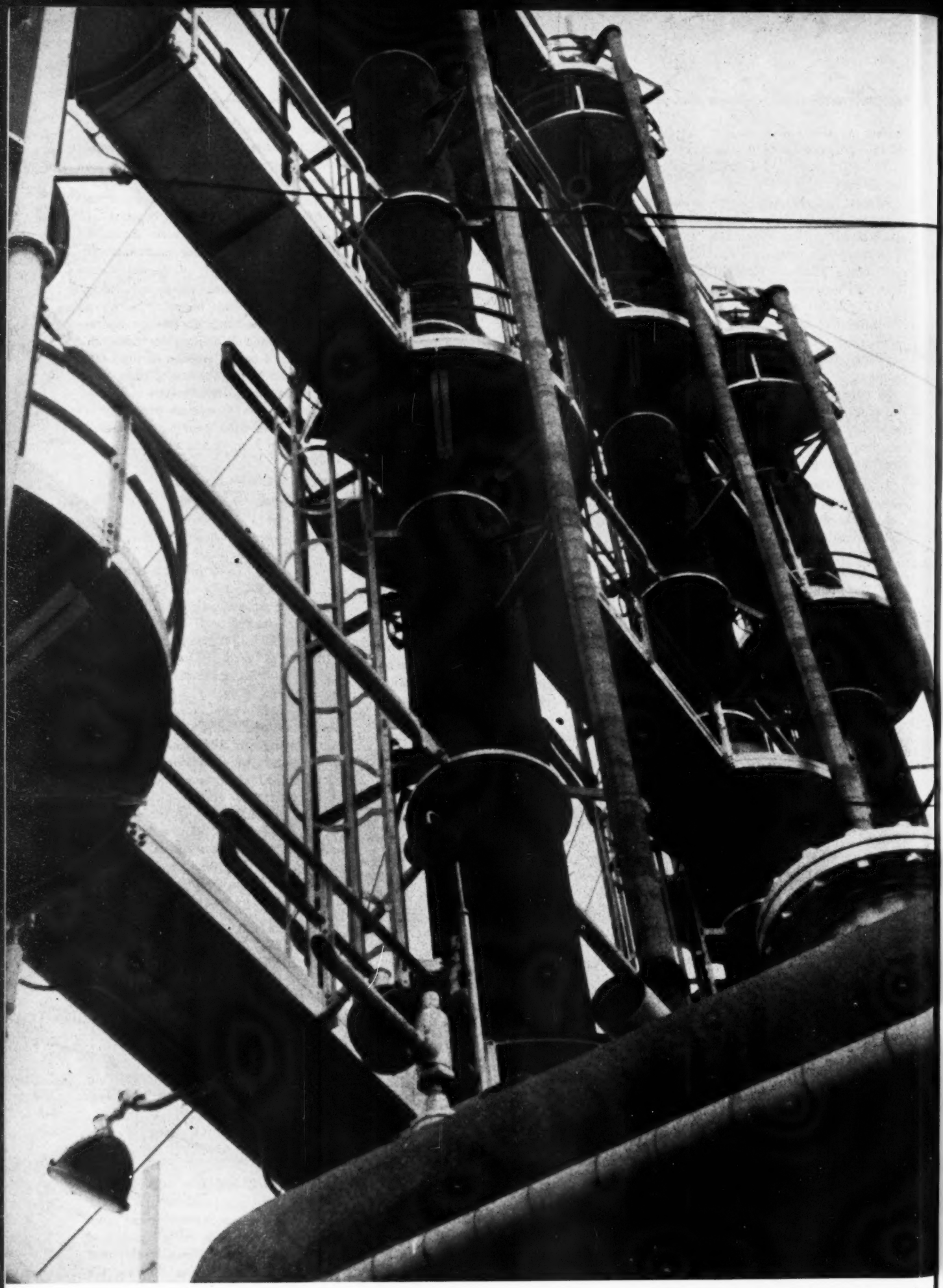
How It Started

In 1944, the Bureau of Standards Paper Laboratory developed a high-wet-strength paper primarily for war maps, made from conventional pulps. The unusual strength was acquired by substitution of resin bonding for natural bonds. The present development, involving experimental manufacture on a semicommercial scale, is essentially an extension of this work to the short-fibered pulps. Widely different combinations of commercial wood pulps were made into a series of papers with controlled variations in beating, with and without synthetic-resin bonding. In all instances, the resin-bonded papers were superior with respect to curling, oil absorption, folding endurance, resistance to surface pick, and expansivity. Several types of synthetic resins have been used, but melamine-formaldehyde resins have given the best results to date. Surprisingly small amounts of the resin are required: usually less than 3 per cent by weight.



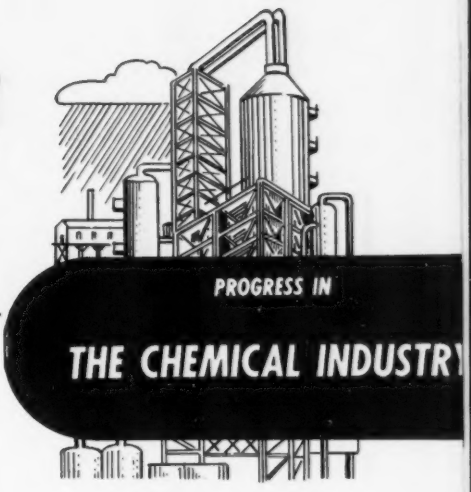
RESIN PAPER: R is on top.

Since the United States is using more paper than ever before in its history and the wood pile is getting smaller, this new method should aid in building up the pile and provide another economic use for the non-coniferous trees.



Towering new plants are adding to the already vast variety of chemical tools for industry.

NEW CHEMICALS and EQUIPMENT POINT WAY TO LOWER COSTS



• In the pages that follow, Chemical Industries again presents its annual survey of new chemicals, new processing equipment and new packaging developments of interest to the chemical process industries.

The response this year to our queries for information about new products was exceptionally good. Indications are that for the first time since before the war manufacturers are actively seeking new markets.

Although the data given on these pages about individual products is necessarily brief, we believe most readers will find enough to indicate whether further investigation seems warranted. The developments reported cover a wide area, and many offer promises of important savings to users who can adapt them to their operations.

Outstanding among the chemicals are products of interest to makers and users of plastics and high polymers. New plasticizers and stabilizers for vinyl resins are appearing which should extend further the applications of this already large group in the plastics field. Styrene compounds and copolymers are also the subject of much developmental work as potentially important low cost materials for resins, plastics and synthetic oils. Terephthalic acid is an intriguing new intermediate of possible significance in synthetic fibers.

A number of interesting compounds continue to appear in which organic and inorganic groups are combined. Examples are some of the newer organic phosphates and organic halides.

The textile, paper, soap and allied fields will find a useful tool in the new so-called "white dyes." These produce an optical effect which gives an appearance of greater brilliance in white materials.

Evidenced across the entire group of new chemical offerings is the effect of recent strides in standardization and refinement of test methods and the increased use of automatic devices for this tpye of work. Thanks largely to these advances, the new materials being offered today are generally backed up by more and better data on properties and performance than their predecessors.

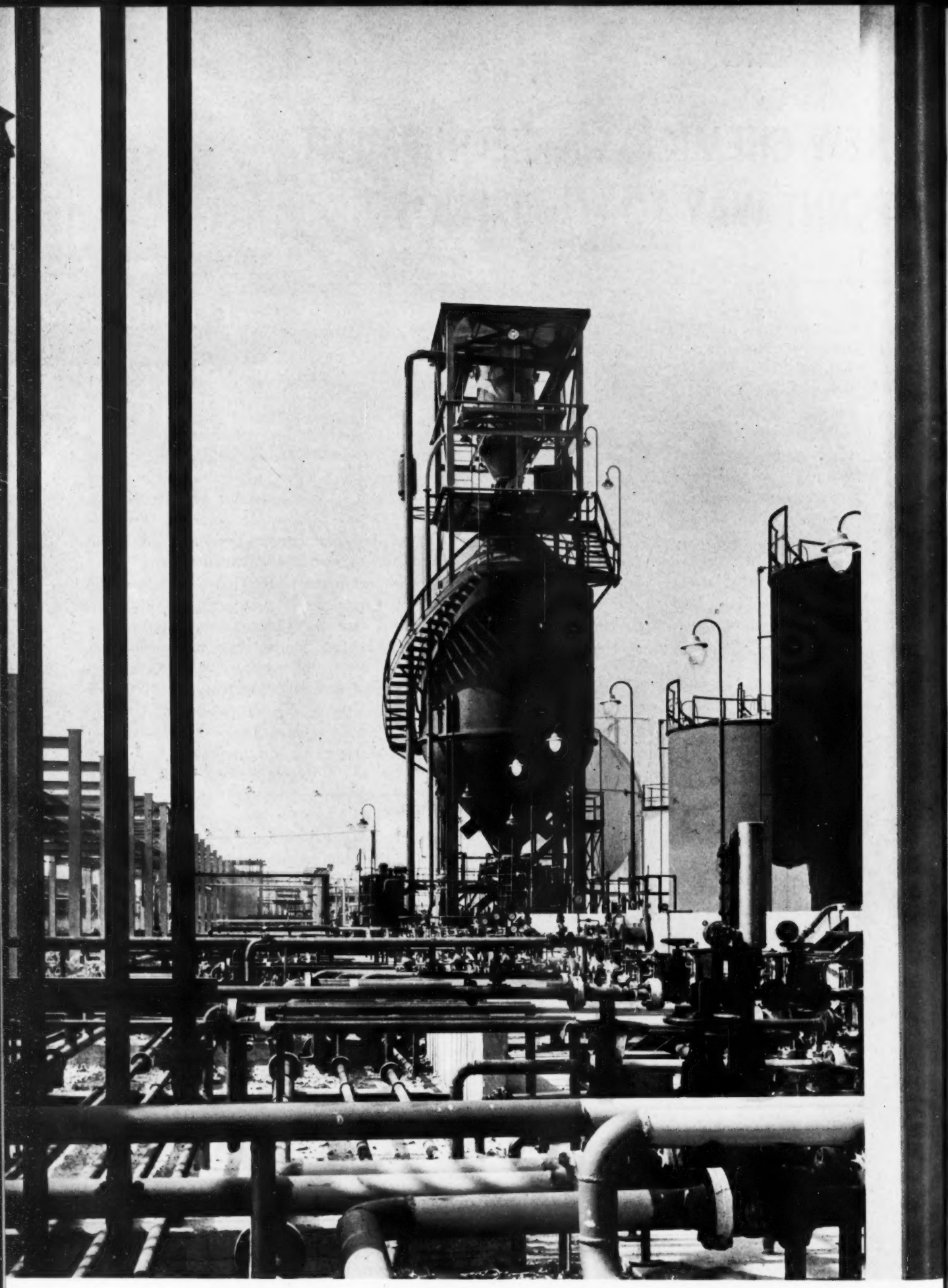
A number of new products have appeared in chemical specialty lines during the past year as interest and activity in this field generally have accelerated. Glass waxes, which leave a protective film on the glass that resists dirt and finger marks, represent a new idea in glass cleaners. Development of synthetic tanning materials has been spurred by high prices for natural tannins.

Process equipment makers have introduced no basically new designs during the past year, but there have been many improvements and modifications of existing designs. In a number of cases a principle or type of machine has been extended into new fields of application. One example is the adaptation of the fluidization technique, originally developed for catalytic cracking of petroleum, to such operations as lime burning and roasting of sulfide ores. Centrifugals are now being used for the continuous saponification of fats for production of soap and for primary separation of starch and gluten, two recent applications.

The installation of the first commercial Hypersorption unit this year marks the advance of adsorption from a method of simple separation of gases to one of fractional separation. Molten salt as a heat transfer medium was made economically attractive for wider use by introduction of a new self-contained "package" unit.

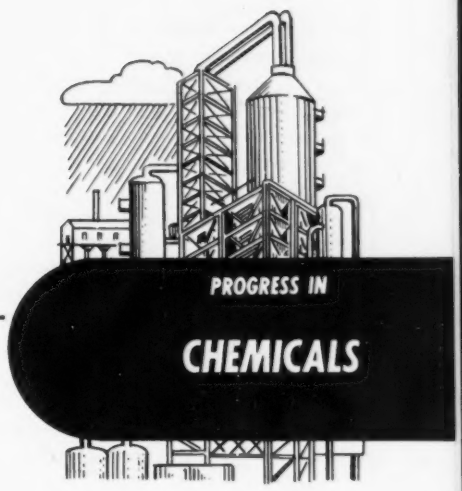
In the field of packaging, aside from continued progress in automatic packaging and handling machinery, container makers themselves have been busy improving their products. Much activity has centered around the development of cheaper and langer-lasting special-purpose coatings for bags, boxes and drums. In the drum field a radically different type of open-head closure has been introduced.

These are but a few of the highlights of what has appeared in the way of new chemicals, equipment and packaging during the past year. The pages that follow summarize many other important developments in each of these fields.



Synthetic glycerine from petroleum became a reality this month as Shell Chemical Corp. started production.

CHEMICAL RESEARCH HITS FULL POSTWAR STRIDE



• DURING THE PAST THREE YEARS, since the Japanese surrender there has been much use of the words "prewar," "postwar," and "reconversion." Those words—and the shape of things they stand for—will continue to exercise their influence on our economy for many decades to come. But they will be used less and less to describe the industrial climate; for industry is now on the postwar straightaway, and the events of 1941-1945 are fast receding into history.

These observations are attested to by the present status of industrial research, and, more particularly, by the introduction of new products. Just after the war there was a pell-mell rush of new products to the market. These products, for the most part, were the outcome of projects shelved for the duration. A smaller part were war-developed materials.

By last year the wartime trough in applied industrial research had reached, as it rippled outwards, new product development; and as a result fewer new materials were announced. Another depressing factor was the simple necessity of producing established materials at an unprecedented rate for the eager, easy-spending civilian market.

Meanwhile, new blood was rushing into the research vacuum. Projects were picked up, new ones were started. Research came back to normal, and the crest of normalcy, like the trough of exigency before it, radiated in time to the development departments and loosed a flood of new materials.

The chemical industry is now riding that crest. As basic production catches up to demand, and the tools of competition are honed to a razor's edge, new developments are assuming a proportionally increasing importance. The expert observations that follow, and the compilation of "New Chemicals for Industry" a few pages beyond, delineate the character and trend of current chemical developments.

COAL-TAR CHEMICALS

by GEORGE D. BIEBER,
Koppers Company



THE coal-tar industry was again called upon to produce large quantities of raw materials for the synthetic organic chemicals industry. Requirements for such bulk products as benzene and toluene were largely met. However, unbalance of demand and supply still exists, particularly in natural phenol, cresols, and cresylic acids as well as pyridine, quinoline, and certain grades of naphthalene. Unfilled markets also exist for phenanthrene, anthracene, and carbazole. Additional amounts of acenaphthene were made available to supply the growing demand for this chemical.

Similarly, demands for such stable coal-tar chemicals as synthetic phenol, phthalic anhydride, and beta-naphthol remained above productive capacities. Nor is it likely that there will be any change in this situation in the immediate future. On the other hand, monochlorobenzene, which was in short supply a year ago, is now plentiful, principally because of increased production facilities and a reduced demand in DDT manufacture.

NEW CHEMICALS

A large number of new coal-tar chemicals were introduced during the past year. New phenolic compounds include methylphloroglucinol, ortho-ethoxyphenol, octylresorcinol, octylphenol, 2-amino-4-nitrophenol, phenethylresorcinols, meta-nitrophenol, and various dimethylaminomethylphenols. A new producer of diamylphenol entered the field during the past year. Hydroquinone derivatives were developed which are suggested for use for a variety of purposes. Terephthalic acid, a possible raw material for synthetic fibers, was announced as well as isophthalic acid, di-*tert*-butyl diperphthalate, and copper phthalate. Various phenyl and diphenylamines as well as benzonitriles are now available. Alky-, alkanol-, and aminopyridines have been added to the list of new tar-base chemicals. Trimethyl-dihydroquinoline polymer and 2,7-dimethylquinoline are also of recent commercial origin. New chlorinated benzoic acids and chlorinated alkyl benzenes are available in limited quantities. Orthochlorotrifluoromethylbenzene and benzotrifluoride are available in pilot-plant quantities. Benzyl trimethyl ammonium hydroxide, phenylbiguanide hydrochloride, nonylnaphthalene, sodium xylenesulfonate, phenyl isocyanate, benzothiophene, and benzenesulfonic acid derivatives have also been added to the ever growing list of new coal-tar chemicals.

NEW INSECTICIDES

The momentum in the development of new pest-control agents, which was accelerated during the war, was again in evidence by the number of new materials reported. Several new insecticides of similar structure to DDT were announced. The compound, bismethoxy-

phenyl-trichloroethane, is said to have greater knockdown power than DDT on flies, mosquitoes, and other insects. Dichlorodiphenyl dichloroethane is reported to be safe for use on vegetables. Bisbromophenyl-trichloroethane is particularly powerful against flies. The insecticide, O,O-diethyl *p*-nitrophenyl thiophosphate is cited as being more potent than DDT and effective against a wider range of insects. Ethyl mercury *p*-toluenesulfonanilide is an odorless seed disinfectant. The compound, 2,3,5-triphenyl-tetrazolium chloride is a new seed germinating agent while 1,3-dimethyl-4,6,-bis-chloromethyl benzene mixtures are useful in preserving seeds in storage. Various salts of 2-4-D are being marketed to increase the usefulness of the chemical.

VINYL PRODUCTS

Technical progress on the first large-scale use of styrene was highlighted by the development of new processes for copolymerizing butadiene and styrene at low temperatures to produce superior synthetic rubbers. During the past year polystyrene consumed a larger proportion of the styrene produced in this country than previously and several high-temperature polystyrenes came into widespread useage. A casting resin, containing styrene, dichlorostyrene, divinyl benzene, and hydrogenated terphenyl, was developed for electrical useage during the war and was made public information during the past year. Styrenated oils have been commercialized which are said to set rapidly, possess high stability, and good color retention. Mixtures of styrene and alpha-methyl styrene appear to have advantages over styrene alone for styrene modified oils. Styrenated alkyd resins have also been announced.

Diallyl phenyl phosphonate is a new monomer for the production of flame-resistant plastics. Vinyl-pyridine-butadiene copolymers are reported to have low heat build-up and high-tear resistance.

OTHER PRODUCTS

Further advances were made by the rapidly growing synthetic-detergent industry. Although other coal-tar chemical derivatives are utilized, alkyl benzenes and alkyl naphthalenes are the principal raw materials for the aromatic types of detergents.

Pharmaceutical research led to the development of 1-(3,4-dihydroxyphenyl 1-1)-2-amino-1-butanol.HCl for the treatment of asthma. The compound 4-4-diphenyl-6-dimethylamino-heptanone-3 is a new pain killer.

Coal-tar bulk products were in active demand during the past year and shortages of some materials as well as certain oldline synthetic derivatives were evidenced. A wide variety of new intermediates was made available.

PHARMACEUTICALS

by ERNEST H. VOLWILER,
Executive Vice-President,
Abbott Laboratories



IN addition to adequately meeting U. S. medicinal requirements, our domestic pharmaceutical industry has extended its services still further in world trade. The total sales of drug and allied industries in 1947 increased approximately 20 per cent over the previous year. Exports amounted to 177 million dollars, or 22.5 per cent more than in 1946, and they were 10 times as large as in the peak prewar year 1938. Relatively new and better drugs have helped to make these records possible.

Against infectious diseases the sulfa drugs are remaining practically stationary in scope of use, whereas antibiotics, particularly penicillin, continue to increase. From 21 billion units of penicillin produced in 1943, production rose to about 40 trillion in 1947, with an expected output of 50 trillion units in 1948. The latter represents approximately 30 tons of pure crystalline penicillin. The output of streptomycin rose from 1,132 kg. in 1946 to 9,687 kg. in 1947. It is the outstanding chemotherapeutic agent available for the treatment of tuberculosis. The United States produces by far the greater amount, and the rest of the world has taken a considerable portion of the total output.

NEW ANTIBIOTICS

Research and development work on new antibiotics is beginning to show encouraging results. The four most promising ones on which rather extensive clinical experiments have been reported are bacitracin, chloromycetin, aerosporin and aureomycin. The particularly favorable aspects of this work lie in the possibilities of effective treatment of diseases produced by organisms previously immune to chemotherapeutic attack, such as Rickettsia and viruses. There is even some hope of an effective chemotherapeutic attack on cancer, although none of the synthetic chemicals, animal or plant extracts, or antibiotics has yet shown sufficient potency to serve as more than a lead for further research.

Because approximately 5 to 10 per cent of our population suffers from allergic symptoms, it is not surprising that a great deal of recent research has centered in this field since it was shown a few years ago that synthetic compounds could effectively relieve such conditions in a rather high percentage of cases. The number of so-called antihistaminic agents on the market has now increased to 10 or a dozen, so that the individual patient's requirements can be taken care of rather well.

TROPICAL DISEASES

Somewhat less attention has been given during the last year to the study of new agents for tropical diseases. This is especially true in the antimalarial field, where the testing of new drugs is no longer as feasible as during the war. This has been due partly to the break-up of the somewhat elaborate organization which had been established for such testing during the war period, and partly because quite effective and rather satisfactory antimalarials of several types are now available. Atabrine has been very largely superseded by Chlorguanide and Chloroquin for suppressive purposes; Pentaquine is available for curative purposes, particularly for the relapsing vivax type of malaria. The future of quinine is yet uncertain, although the synthetic products have by no means displaced it completely in world markets.

A new piperazine derivative called Hetrazan gives promise of superseding other drugs for the treatment of filariasis. A number of new synthetic compounds are under investigation for schistosomiasis. Research on new sleeping sickness remedies has not yet borne fruit so far as actual production of new products for the market is concerned.

An appreciable amount of attention has been given to the use of radio isotopes as tools rather than as curative or remedial agents, although in the latter field radioactive phosphorus has good clinical applications, and radioactive iodine and gold show some promise. It is likely that for some time the principal medical interest in the radio isotopes will lie in their uses to determine the mode of action, the localization, and the mechanism of destruction of various types of drugs.

The most interesting work in the vitamin field going on at the present time appears to be the investigations of the so-called Vitamin B_{12} as an antipernicious anemia factor occurring in liver extract. Certain folic acid derivatives and analogs are being used experimentally in cancer and other conditions.

The European Recovery Program will probably have little effect on the American pharmaceutical industry. Although appreciable exports of drugs are made from the United States to various European nations, those countries are making strenuous efforts to be nationally self-sufficient in this field. The anticipated addition of 250,000 young men to our armed forces, however, may increase the military drug requirements by 50 per cent.

The present rate of expenditure for

medical research in the United States is approximately $113,000,000 per year, of which $50,000,000 to $60,000,000 is spent by the pharmaceutical industry. With this much attention to the subject by industry, universities, and government agencies, the continued development of new tools for the relief of man's physical ailments may confidently be expected.

SYNTHETIC ORGANICS

by RALPH CONNOR,
Associate Director of Research,
Rohm & Haas Co.



INCREASING construction costs have, during the past year, caused the cancellation, postponement or curtailment of the ambitious expansion plans of many industries. This has influenced not only plans for increased production of existing products but also the marketing of new products. Nevertheless, the completed project represent an impressive achievement for the industry.

KEEN COMPETITION

Competition has become keener in the production of large volume organic chemicals. Thus, new manufacturers have engaged in the production of ethylene oxide, ethylene dichloride, acetaldehyde, acetic acid, butyl alcohol, carboxymethyl cellulose, methanol, glycol, phenol, *n*-propyl alcohol, hydrogen cyanide, high-molecular-weight alcohols and alkylated aromatics. The alkylated aromatics, designed for conversion to sulfonates for synthetic detergents, alone represent a substantial development. Additional capacity for urea and pentaerythritol and completion of facilities for synthetic glycerine will help to make these chemicals more freely available. Among the synthetics which are established products but with a smaller demand than the above examples, it may be mentioned that new producers of ethylene diamine and 2,4-D have entered the field. While the examples given in this paragraph do not represent by any means a complete list, they do illustrate the development of alternate suppliers of imany basic chemicals —a trend which will be welcomed by many users of chemical raw materials.

In considering new chemicals, the past year has been a banner year for development products. This situation, occurring in spite of the increasing costs of plant construction, is perhaps a summation of many factors: (1) Research sidetracked during the war years has been brought to completion so that a cumulation of these projects may now be appearing. (2) There is perhaps an increased realization that no one organization is sufficiently diverse to explore all fields of application; and that a novel chemical, made freely available, may find its outlet as a result of application studies of other laboratories. (3) In some companies, it may be considered that the present economic conditions make this a particularly appropriate time to devote to new products. Certainly the development of a product which could command the "premium price" of which all industrial chemists dream, would simplify the selection of future construction projects of a concern with little free capital.

NEW PRODUCTS

Whatever the causes, the new products of the past year have been notable, not only in number, but in chemical diversity. The following examples are not chosen by attempting to evaluate their importance, but only to illustrate the diversity of chemical structures of the products and of the processes used. The availability of the following chemicals ranges from production quantities to samples for experimental work: benzonitrile, aconitic acid, diethyl phosphite, sarcosine, butynediol, propargyl alcohol, thiophene and derivatives, isobutyl acrylate, crotonic aldehyde, pyrrole, terephthalic acid, methanesulfonic and ethanesulfonic acids, Grignard reagents, di-β-naphthyl-*p*-phenylene, hydroabietyl alcohol, ethylene thiourea, divinyl benzene, quinone, dihydropyran, acetone cyanohydrin, β-propiolactone, acrylic acid, vinyl ethers, hydroquinone derivatives, new quaternary ammonium derivatives, surface-active compounds derived from mercaptans, new high-molecular-weight amines, ion-exchange resins both of higher capacity and of new chemical types, fluorinated organic compounds, diglycolic acid, cumene hydroperoxide, allyl starch, chlorinated compounds including the methoxy of analog of DDT, and surface-active compounds derived from the reaction of olefins with nitrosyl chloride followed by treatment with sodium bisulfite.

OXO AND FISCHER-TROPSCH

While predictions are not a usual function of this type of review, it may be appropriate to point out two forthcoming developments which may be expected to have a profound influence on the future of synthetic organic chemicals. Products obtained from hydrogen, carbon monoxide, and olefins in the presence of cobalt catalysts (the "OXO process") will be available in appreciable quantities in a matter of weeks. The operation of Fisher-Tropsch plants is not so imminent, but can be expected in a few years. The prospects of alcohols, acids and aldehydes from the OXO process and of relatively straight-chain paraffins and olefins as well as oxygenated by-products from Fisher-Tropsch plants will undoubtedly have a strong influence upon the thinking of chemists and hence upon future new chemicals.

RUBBERS, PLASTICS AND POLYMERS

by HERMAN MARK,
Director, Institute of Polymer Research,
Polytechnic Institute of Brooklyn



ORGANIC macromolecules are interesting and important in several branches of the chemical industry as rubbers, plastics, fibers, exchange resins, protective colloids, lacquers, coatings, varnishes, etc. They have been a domain of rapid progress during the last two decades and have kept up a sharp pace of development during the last year. Without any attempt to be complete or exhaustive, this brief report intends to enumerate a few especially spectacular achievements of the past year. Rubber chemistry and technology is, at present, dominated by new types of synthetic elastomers containing cheap and plentiful monomers, such as butadiene, isoprene, isbutene, styrene, and acrylonitrile, having properties much superior to those of the classical synthetic rubbers Buna S, Buna N, GR-S and even distinctly superior to those of native hevea rubber. The progress was essentially achieved by the application of new and powerful polymerization catalysts which permit the synthesis of the rubbers at unusually low temperatures. It seems that, under such conditions, the chemical structure of the long chain molecules is more regular and better controlled, which leads to elastomers of easy processibility and excellent properties. The use of new monomers, such as fluorinated and alkylated butadienes, has also led to materials which maintain their rubbery character down to very low (−80° C) and up to very high (+150° C) temperatures.

PLASTICS

In the field of coatings and soft plastics, great interest has been aroused by the discovery of new plasticizers and stabilizers. The intimate mixing of a hard resin, such as Geon or Vinylite with a

rubbery polymer such as Hycar or Perbunan in the state of a fine emulsion has resulted in the production of polyblends, which combine toughness with flexibility over a wire range of temperatures. A great disadvantage of many vinyl type resins was their limited stability against the action of light, heat and oxygen; it has been found that organic compounds of tin and lead and basic silicates of several heavy metals have an excellent stabilizing action.

Molders and users of rigid, transparent, colorless plastics will be interested in the prevailing trend to arrive at materials which combine their good electrical, optical and mechanical properties with lower brittle points and higher softening ranges. Lowering of the brittle temperature of such typical candidates for high speed injection molding as polystyrene, polyethylene, polymethyl methacrylate, cellulose acetate, can be achieved by increasing the average molecular weight of the material or (probably better) in eliminating low molecular weight fractions by extraction or fractionation procedures. Substantial increases of the softening range require resorting to new monomers such as chlorinated, fluorinated or alkylated styrenes and other aromatic vinyl derivatives. Excellent resistance against all chemical and thermal influences is also shown by fluorinated and fluoro-chlorinated polyolefins and polydiolefins, of which polytetrafluoroethylene (Teflon) is a particularly interesting representative. The field of these high softening organoplastics is gradually merging with the low softening inorganic glasses and ceramics and it is becoming more and more obvious that the combination of these two types of materials offers interesting outlooks.

FIBERS

Great progress has been made in the entire field of fiber forming macromolecules. Natural proteins have been spun to give strong and water resistent filaments, synthetic polypeptides have been prepared which seem to be very interesting candidates for silk and wool-like fibers. Cellulose type fibers, (viscose and acetate rayon) of finer denier, higher tenacity, better wet strength and greater uniformity have been produced. A nylon type fiber of rubberlike elasticity and fine denier has been developed which offers new combinations and possibilities in many textile designs. Vinyl type polymers based on cheap monomers have been spun with success and have led to fibers of very attractive properties for use in apparels and outdoor fabrics (Fiber A, Vinyon N). In the technology of synthetic fibers there has been a permanent trend to more uniform and more continuous operation which is highlighted by the introduction of the selfadvancing reel in viscose rayon spinning.

NAVAL STORES

by J. M. SCHANTZ,
Manager, Technical Service,
Naval Stores Dept.,
Hercules Powder Co.



DURING the naval stores' season of April 1, 1947 to March 31, 1948, the chief development was the decided shift from short supply to one of plentiful supply. This was largely caused by an increase in the production of both wood and gum naval stores. Stocks of rosin, turpentine, pine oil, and monocylic terpenes have risen and prices have fallen as a result of the increased supply. While the new loan value on rosin has stabilized rosin prices at a somewhat higher level, the marked decrease in the loan value of turpentine was immediately followed by a drastic reduction in its market price. Prices of alpha-pinene, beta-pinene, pine oil and monocyclic terpenes were similarly affected. It now appears that prices of these commodities have levelled off at new post-war lows that will probably continue for some months ahead.

The forecast for a 10-20 per cent increase in production of gum naval stores and for a further increase in wood naval stores should assure a good supply of all primary products during this year. While stocks of some commodities have increased, heavy sales during the past two months both in domestic and export markets have actually decreased stocks of turpentine and allied products. Demand for rosin has largely kept paces with production.

The three largest producers of wood naval stores have made a considerable investment in the construction of new modern plants or in the replacement of existing equipment with new equipment. This has resulted in larger production with improvement in yield and quality of product.

TERPENE HYDROCARBONS

Use of terpene hydrocarbons as raw materials for chemical processes continues to grow. The requirement of alpha-pinene for synthetic camphor in the United States, England, Italy, and Germany is growing rapidly. Use of alpha-pinene and monocyclic terpenes for production of oil additives is on the increase. The use of beta-pinene derived from sulfate and gum turpentine for the production of synthetic resins is still expanding. The limiting factor appears to be capacity to produce beta-pinene of required purity.

Production of Toxaphene (chlorinated camphene) has increased considerably during the year. This new insecticide is being used in increasing quantity for the protection of cotton crops and for grasshopper control as a result of field tests made during the past several years by federal and state agencies. Commercial production of camphene has been announced by one of the leading producers of gum naval stores.

Terpene ethers derived from turpentine have developed steady markets in a number of diversified fields. Lower prices now in effect are expected to expand their use.

Monocyclic terpenes are derived from natural oils and also as by-products from chemical conversion of pinene or turpentine. While demand for these terpenes has been good, supply has exceeded demand and stocks have increased considerably. These solvents are now at lower prices which should stimulate their use as chemical raw materials. There is considerable interest in them for conversion to para-cymene, which may be converted to carvacrol and thymol or oxidized to dibasic acids. Their present low price is expected to greatly stimulate their use as industrial solvents, thinners for paints and varnishes and sanitary preparations. Also there is considerable interest in their use for copolymerization with other substances to produce resinous polymers. An expanded use in the preparation of terpene phenols and sulfurized terpenes is expected.

PINE OILS

Supplies of pine oil have increased to the point where they exceed demand and stocks have increased. However, reduction in price has stimulated the use of pine oil in all major consuming markets and a good balance between supply and demand should prevail in the near future. Markets lost or curtailed during the period of pine oil shortage are being regained and new uses are being developed in the textile and other important consuming fields. The production of synthetic pine oil has been largely discontinued. Consideration is being given to pine oil as a raw material for chemical conversion.

Production of modified rosins such as hydrogenated rosin, polymerized rosin, and disproportionated rosin has not changed greatly during the past year. These resins are continuing to find new applications at home and abroad in many diversified fields. A new derivative of rosin, hydroabietyl alcohol, reached commercial production during the past year and is rapidly taking its place as a new industrial commodity.

Production of Rosin Amine D has remained in pilot plant stage, but at a

considerably increased rate. This new derivative of rosin is being field tested with encouraging results in a large number of diversified fields. Commercial production is forecasted at about the turn of the year.

RESEARCH GAINS

Research in both branches of the naval stores industry continues at an accelerated rate. The research on gum naval stores by the U. S. Forest Service and U. S. Department of Agriculture Regional Laboratories is bearing fruit. As a result of their work, the old fire stills have been replaced by modern steam stills in central gum-cleaning plants using a process developed by these agencies. A new continuous process, reported to be in pilot plant stage, may revolutionize this old industry. Also a process for separating rosin into fractions which have greater industrial utility is reported to be in advanced stages of development.

Research in the laboratories of the wood naval stores producers continues at an increased rate directed toward the development of new products and new uses for old and new products.

These research activities coupled with the work being done by many of the leading industrial research laboratories will insure a steady market for the products of this oldest American industry.

INORGANIC CHEMICALS

EDITORIAL STAFF REPORT

THE PAST YEAR was marked by several developments in the chlorine-caustic field. The first Mathieson mercury cell was installed outside of the parent company at Alcan's Arvida, Que., plant. A few months ago Mathieson announced that its cell would be licensed to domestic as well as foreign producers. Dow, meanwhile, is switching to mercury cells for its new 50 ton/day plant at Sarnia, Ont. Two types —the Krebs cell and one developed from German models — will be installed. A purification problem will be obviated by recirculating the anolyte in the well, resaturating it and precipitating the impurities in the salt cavity.

Chlorine output is estimated this year at 1,600,000 tons, up from last year's by 235,000. An increasing proportion is going into chlorinated compounds, less (proportionately) into pulp bleaching, disinfectants and sanitation, textiles, and miscellaneous uses. Several new plants came in, but expansion has now leveled off.

Considerable interest is being shown in the Deacon process and variations upon it. A patent to Standard Oil Development Co. describes a fluo-solid catalytic oxidation of HCl to chlorine wherein a suspension of iron oxide in HCl is passed into a hot chamber, where the oxide is converted to the chloride; in a still hotter chamber, where the suspension meets an oxygen-containing gas, chlorine is evolved and iron oxide is regenerated.

Solvay's nitrosyl chloride output is expanding to match increased production of the detergent, Nytron, made from it. Several chlorine compounds are now being made at the Nevada-owned Basic Magnesium, Inc. plant at Henderson. Western Electrochemical Co. is making chlorates and perchlorates; Stauffer is producing chlorine; New York-Ohio Chemical Co. is manufacturing aluminum chloride; and Coulter, Harden & Co. is making anhydrous chlorides of magnesium, calcium, barium and manganese.

FLUORINE GROWS

Interest is fluorine continues to grow. Penn Salt is building a fluorine chemicals plant in Kentucky to utilize Ohio Valley fluorspar. Mexican fluorspar is receiving increased attention as domestic sources are pressed. Harshaw is making chlorine trifluoride, and Penn Salt may. General Chemical Division is now producing antimony pentafluoride in the pilot plant. Various salts of mono- and hexafluorophosphoric acids are being introduced by Ozark-Mahoning Co.

The "farm boom" has spurred interest in fertilizer materials. Several companies, both here and in Canada, have built new or additional superphosphate facilities, and TVA has developed and put into practice a new, continous process for making "triple" superphosphate. Westvaco is building the first western elemental phosphorus plant at Pocatello, Idaho.

Spencer Chemical Co. and Phillips Chemical Co. have, respectively, bought Jayhawk and leased Cactus Ordnance Works. Both will produce ammonia and ammonium nitrate, and Phillips will also construct an ammonium sulfate plant. Several domestic producers are expanding nitrogen chemicals capacity; and more and more anhydrous ammonia is being sold for direct addition to soils.

The last year has also been marked by a 10 per cent increase in sulfuric acid capacity, much of it in the Western states for fertilizer use.

OXYGEN EXPANDS

Tonnage oxygen use, especially in steelmaking, is expanding rapidly. It may also find its way into manufacture of synthetic fuels and other oxidation-derived chemicals. Linde Air Products will build a plant to supply Du Pont's Belle, W. Va., plant with 360 tons/day of 95 per cent oxygen.

Several companies have come out with colloidal silicas for use as flatting agents, in textile treatment, and for improving the qualities of adhesives, sizes, coatings, and waxes. Du Pont makes a 30 per cent aqueous dispersion by passing a sodium silicate solution through a base-exchange resin. Linde and Davison Chemical Co. have also introduced extra-fine silicas.

Davison has developed a silica gel oxidation catalyst; and a silica-magnesia catalyst developed by Esso Standard is said to increase cracking yields of gasoline by 25 per cent—although the octane rating is lower.

A "stabilized" zirconia refractory, in which the volume change at high temperature (which causes spalling) is minimized, has been introduced by Titanium Alloy Manufacturing Co. Zirconia is also competing with iron oxides and ceria as an abrasive for polishing glass and marble.

International Paper Co. will reclaim lime from paper-mill sludge by a Dorr-designed fluosolids units. Another Dorr unit will recover lime for recycling in Lansing, Mich.'s water-softening plant.

LEAD SHORTAGE SHOWS

A new lead pigment, made by mixing silica with lead oxide, adding sulfuric acid, drying and firing, is claimed by National Lead Co. to be superior for paint manufacture. It goes three times as far, with respect to lead content, as white lead.

Zinc and beryllium salts, claims Wyandotte Chemicals Corp., inhibit the attack of caustic cleaning solutions on glass. A 3 per cent solution of the company's "inhibited" alkali dissolves less glass than does distilled water.

Eastman Kodak Co. has developed a new, continuous process for making silver nitrate. Photographic chemicals output, incidentally, may rise as a result of television: Since many teleshows will be projected from film, it has been estimated that motion-picture film consumption will triple in the next five years.

Among the lithium salts, Metalloy Corp's lithium amide is finding large commercial use as a condensing reagent in drug manufacture. Metal Hydrides, Inc., is going into full-scale production of lithium aluminum hydride, a unique reducing agent.

POTASH SALTS

International Minerals & Chemical Corp. will use improved processes for the production of potassium chloride and sulfate in its planned Carlsbad, N. M., plant. American Potash & Chemical Corp, is pilot-planting a process for extraction of tungsten from Searles Lake brine.

The Beth-Tec unit, developed by Bethlehem Foundry & Machine Co., is extending the use of molten salt baths (eutectic mixture of sodium nitrite, sodium and potassium nitrates) in chemical processing. These baths are useful for heat transfer in the 400°-850° F. range.

It is hard to tell whether radioisotopes should be classified as inorganic chemicals or not. In any case, well over 2,500 shipments have been made to U. S. research institutions, and 44 shipments went abroad during the first six months that exports were authorized. Production and demand should increase.

DYES

by BYRON L. WEST
Calco Chemical Division,
American Cyanamid Company



THE past year has witnessed the collapse of the sulfur color and indigo export market to China due to inflation and lack of exchange there. The domestic sulfur color market is slow because the trend is toward faster colors for the higher priced fabrics. There is a continued trend toward the faster colors, particularly those direct colors for rayon which are fast to light after resin treatments.

The shortage of the basic raw materials continues: benzene has eased somewhat; but, although no worse than a year ago, the naphthalene shortage is still serious.

FUNDAMENTAL STUDIES

Intensive basic research in coloring and finishing textiles continues, both here and in England. In Britain, interest in the fundamentals has resulted in a consolidated effort of the country's best men in the field of textiles. Much valuable information has been obtained there. In the U.S.A. also considerable fundamental results are being obtained.

One paper describes 23 modifications of the G.E. automatic recording spectrophotometer[3]. In this paper seven illustrative examples are listed where the modifications were helpful in such problems as chemical analysis on fibers, chemical identification in solutions, determination of reaction rates, determination of refractive index and absorption coefficients of inks, chemical analysis by transmission, measurement of crystal structure, and the colorimetry of chemicals.

Two excellent symposia deal with fundamentals: one[3] on this side of the Atlantic on Color and Electronic Structure of Complex Molecules; and the other[4], the Blackpool three-day meetings of last September on Recent Advances in Theory and Practice of Dyeing.

McBain *et al.*[5] reported that strong solubilization of a water-insoluble dye, Orange OT, by colloidal electrolytes and non-ionizing detergents appears as soon as a colloid is present. They studied the complete ranges of concentration from 0 to 100%.

Brode *et al.* have continued the work on color and constitution[6]. They reported on some effects on non-coplanarity on the absorption spectrum of some unsymmetrical disazobenzbidine dyes. Bowen presented a theoretical discussion[7] on the relationship between color and constitution and the absorption of light by chemical compounds. Ramart-Lucas *et al.*[8] made a general study of the tautomerism between azo phenols and quinhydrones.

A new theory of direct dyeing is presented by Crank[9] in terms of the Langmuir Theory of Surface absorption, modified to allow for the effect of foreign electrolytes in the dyebath. A simple formula is derived and is shown to account satisfactorily for the main features of equilibrium dyeing of cellulose by Chrysophenine G in the presence of sodium chloride. Neale, at the Blackpool symposium,[10] attempted to provide a simple physical picture of the effect of electrical forces upon the dyeing process. Since both fibers and color ions are electrically charged, they either attract or repel one another, according to whether they are oppositely or similarly charged. This electrostatic effect, however, is not the principal factor in the affinity of the dye for the fiber, but rather the variations in the strength and character of the electrostatic force are responsible for the effects of salt in dyeing and for the effect of acid on dyeing silk and wool.

Dickinson[11] reported that the absorption and photographic sensitizing properties of two cyanine dyes are related to their degree of aggregation. Lemin and Vickerstaff[12] conclude from their work on direct dyes and Methylene Blue 2B that many dyes and dye mixtures in aqueous solution at room temperature contain aggregates. A detailed study of the absorption bands of Methylene Blue 2B over wide range of concentration suggests that aggregates larger than dimer are present in appreciable amounts in strong aqueous solution. Meggy[13] made an intensive physical chemical study of the combination of Orange II with wool keratin.

ANTHRAQUINONE DYES

An improved preparation of bromine acid (1-amino-4-bromo-anthraquinone-2-sulfonic acid) has been disclosed wherein the bromination is accomplished in just enough salt solution to salt out the product as fast as it is formed. From Russia comes a method for the preparation of 1,4-anthraquinone disulfonic acid from 1,4-dichloranthraquinone and sodium sulfite; also a method for the preparation of 1-chloro-4-sulfoanthraquinone from the disulfo compound with nascent chlorine. The substitution of the sulfonic group by chlorine is not new to the chemical industry[12a].

A new system of identification of vat dyes by means of acidified potassium permanganate was described at the Blackpool Symposium[14]. Two comprehensive reviews, one by Muller[15] and the other by Turner[16] have been made on protection of the lightfastness and fiber-tendering in mixtures of vat dyes. A patent has been granted for the reduction of this photo-tendering by yellow and orange vat dyes by treating the dyed fabric with a solution of the product of formaldehyde and dicanodiamidines or melamine.

Many new wool dyes have been disclosed that further substitute the cyanine green and the sky blue structures. New oil-soluble anthraquinone dyes are prepared by condensing alpha mono and dinitro 2-methylanthraquinone with aliphatic amines. Two new Celanese anthraquinone patents are disclosed: The first for the dye 1-monoethanolamino-4-monoethanolamino-6-chloranthraquinone; and the other, dyes formed by introducing a phenylamino group into an alpha position of alpha aminoanthraquinone and an alkyl thioether group into a beta position.

Important process improvement are disclosed on ring closure with aluminum chloride of anthrimides to carbazoles: the use of nitrobenzene sodium sulfonate and the use of such solvents as trichlorobenzene; and for successive ring closure treatment of mixed dibenzoylamino dianthrimides first with aluminum chloride and nitrobenzene and then with sulfuric acid to effect complete carbazole formation.

Among the patents for new vat dyes we find: scarlets especially fast to hot pressing, consisting of 1,4-dibenzoylamino-anthraquinones, in which the phenyl residues are substituted by different alkylamino groups; new fast oranges to browns consisting of acylaminoalpha, beta dianthrimide acridones; oranges to browns of excellent fastness by condensing an anthraquinone-chloro-benzthioxanthone with a monobenzoyldiaminoanthraquinone and carbazolizing; fast blues to violet of the anthraquinone-benz-acridone class containing a 4-benzoylamino group substituted by an alkylsulfonyl radical; and a bright green by condensing a 2-(halogenobenzoylamino) anthraquinone with 4-amino-antraquinone-2:1(N)-benbacridone.

PRINTING ASSISTANTS

Several patents were granted for printing paste from ester salts of a leuco vat dye and stable internal quaternary amino acids or acid amides of the class consisting of betaines containing a benzoyl radical and/or a soluble internal salt of sulfobetaine. A printing paste for use on nylon fiber is disclosed as containing caprolactam.

AZO DYES

The aluminum chloride cleavage procedure to produce from dianisidine 3,3' dihydroxy - 4,4'diaminodiphenyl (dihydroxybenzidine) has been described. Many patents have been granted for its use for producing disazo dyes capable of being metallized. The use of 4(beta-hydroxyethylsulfonyl) aniline as a diazo

component in pyrazolone couplings has been disclosed. New coupling components include 3-aminopyrazolones and alkylaralkyl and aryl esters of the sulfonic acid of metaphenylenediamine. Metallizable dyes are prepared by coupling diazotized amines containing lake-forming groups with the 3-aminopyrazolones, which are made by condensing hydrazines with ethylcyanoacetate.

Stemming from the phthalocyanine work to produce soluble dyes, we find azo dyes made from metal phthalocyanines having aminophenyl groups and from aminophenylmercapto copper phthaloaminophenyl groups and from aminophenylmercapto copper phthalocyanine. In addition there are the yellow azo wool dyes patented which are quaternary ammonium salts derived from 4,4′-dibenzthiazil(2)azobenzene.

Among the new azo dyes for cellulose acetate are found those derived from 3-carbalkoxypyrazolones and a nitrothiocyanoaniline; and dyes containing a trifluoroacetylamino group.

Specific combinations of well known intermediates include the bright metallized blue from 4-chloro-2-aminophenol-6-sulfonic acid diazotized and coupled with Chicago acid; the dyes obtained by diazotizing 4-nitro-2-aminophenol and coupling with 6-bromo-2-naphthol; a substituted Naphthol Blue Black (C.I. 246) in which aniline is replaced by a many-substituted phenylamine; dyes from tetrazotized 4,4′-diaminodiphenylurea-3,3′-dicarboxylic acid coupled with a phenylmethylpyrazolone containing a sulfamide group; new copper disazo dyes from resorcinol and diazotized 3-amino-4-hydroxy-1,1′-diphenylsulfone; and several new combinations of metallized or metallizable trisazo dyes which employ derivatives of J acid.

AZOICS

No startlingly new naphthols have been disclosed. The use of aminobenzene sulfonylfluorides as fast bases has been patented. New anti-thinners to prevent thinning of printing pastes containing diazo compounds have been disclosed as double and triple bonded compounds, such as olefin carboxylic acid amides, soluble in water.

New stabilizers are few: one for making soluble diazoamino compounds using ethanol and methylol groups for solubilization has been patented.

New pigment compositions made by co-precipitation of copper phthalocyanine and dichloroisodibenzanthrone have been disclosed. A reddish blue is produced without dulling the shade. The new pigment has unexpectedly increased strength higher than either component alone.

Further evidence of the shift in emphasis from work on phthalocyanine pigments to research on dyes is accumulating in no uncertain terms. Several new sulfur dyes have been disclosed. Metal phthalocyanines having aminophenyl groups and aminophenylmercapto copper phthalocyanines are used as diazo components for new azo dyes. And now comes the patent covering chloromethyl-copper phthalocyanines that are quaternized to give valuable dyes. This is believed to cover Alcian Blue 8GS, a new fast, water-soluble, brilliant turquoise blue printing dye which has been recently announced.[17] It is described as made by the chlormethylation of Monastral Fast Blue and the subsequent interaction of the product obtained with a tertiary amine to give an "Onium" salt. The textile fiber is impregnated by a printing process and the dye is rendered insoluble in the fiber by a subsequent process, creating great fastness to washing.

Coppery, bluish red and violet pigments, somewhat remotely related to the phthalocyanines in that they contain the pyrrole nucleus, have been disclosed.

Bright orange and yellows with excellent fastness to washing, chemicals and light are disclosed as azobenzene(benz) thiazyls, among new sulfur dyes.

Improved solubility in water and alcohol is claimed for basic triarylmethanes by two procedures: one producing the hydrofluoric acid salts and another by binding the basic constituent of the dye with glycerol phosphoric acid.

RESIN BONDED PIGMENTS

Of the four systems for the application of these colors we find the first (the aqueous dispersion) has found an outlet in the cheaper applications. Here water and light fastness requirements are not too stringent, as, for example, on potato, onion or fruit bags, where the water-soluble binders are insolubilized by heating. In the second system (the solvent dispersion) nothing startling or new has been proposed. In the third (water-in-oil emulsion system) a considerable improvement has been made in the resistance to crocking. This, of course, is the best and most widely used system for printing and has established for itself a definite place in the textile field. In the fourth (the oil-in-water emulsion system) the use of sodium alginate to prevent migration of the pigment is a definite improvement. The function of the alginate is to flocculate the pigment just sufficiently to slow down the mobility of the dispersed particles, but not enough to affect the stability of the emulsion.[19]

Although not resin-bonded pigments, there are new emulsions for textile printing disclosed as the water-in-oil emulsions for printing with water-soluble dyes of the chrome, direct and azoic types.[20]

The reddish blue phthalocyanine-dichloroisodibenzanthrone mixture previously mentioned provides reddish bright shades of increased strength. Diazotized aminobenzene sulfonfluorides coupled with acetoacetarylides are disclosed. A patent has been granted for the tetrazotization of a mixture of isomeric diaminodiphenyls and coupling with a methylenic azo coupling component.

NEW DYEING METHODS

A continuous method for dyeing long chain warps with vat dyes utilizing a combination of pigment padding, followed by saturation with appropriate reducing chemicals and then followed by fixation in steam atmosphere, is now producing in 6 hours sufficient warp for weaving 50,000 yards of denims. Men's hose are now dyed with vat dyes in regular hosiery type dyeing machines. No longer must the housewife wash her husband's socks by hand, separate from white goods.

Wool fabrics for upholstery are now widely dyed with vat colors. Such improvements as increasing the caustic concentration to obtain greater money value on wool may be at the expense of incipient damage to the wool fiber.

Several patents recently issued on the solvent dyeing of cellulose acetate with alcohol-soluble acid, direct, and other dyes are modifications of an established procedure. Improved results are claimed by the addition of small amounts of swelling agents to the solvent.

Leading the list of new developments is the beautiful Alcian Blue 8GS, which has been classed as a "brilliant" and is claimed to have fastness to washing never before obtained in a blue of its shade. A new alizarine green is on the market. Three new vats—a red, a grey, and a bright fast yellow, have been introduced.

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International Printing Ink

Careful compounding and high standards have boosted chemical specialties sales to the $2 billion class.

CHEMICAL SPECIALTIES ATTAIN GREATER STATURE



• CHEMICAL PROCESSING industries are paying greater heed to chemical specialties. This trend is evident in the increased number of special products divisions that suppliers of basic chemicals are setting up within their own organizations. In bringing to this field their vast resources for research, production, and marketing, these companies offer coordinated development programs to further the aim of this $2-billion industry: better chemical products for particular needs at lower cost.

Matching this trend are the expanded research activities of specialties manufacturers who have traditionally been, and continue to be important consumers of basic chemicals. In the days when anyone with an empty garage and a tank could "manufacture" a product, quality was more often than not a lucky accident. The present day manufacturer knows that an alert research staff is a better bet.

While recognizing the value of vigorous individual activity, companies have remained conscious of their positions as members of an important industry. Cooperation through professional societies and trade associations has reached new highs. Manufacturers have striven to solve mutual problems and to maintain high quality of products by establishment of fair standards and uniform tests.

Although more large companies are entering this profitable field, the little fellow has not been squeezed out. It has been dramatically demonstrated during the past year that there is a place for anyone with a product that can do the job better than the other fellow's. This industry, as has all industry, has grown on such free competition. CHEMICAL INDUSTRIES' third annual survey of New Specialties presents descriptions of the new products brought forth in such an atmosphere, points out significant developments and trends.

POLISHES

by DANIEL SCHOENHOLZ,
Research Director,
Fostor D. Snell, Inc.



OF VITAL interest to wax polish manufacturers is the action of Brazil to establish minimum prices for carnauba wax. Such a policy intelligently executed may be of benefit to both the Brazilian gatherer and the American manufacturer in stabilizing the price of this commodity and eliminating the speculative aspect of carnauba purchasing. It is felt by many however, that the price has been set at so high a level as to encourage again the use of substitutes and extender waxes. Current speculation is that this will force a recession in prices and many buyers are therefore delaying purchases.

The increase in substandard shipments of carnauba wax suspected of adulteration has caused considerable trouble to importers and users and indicates the necessity for setting practicable specifications for this wax, and the development of satisfactory tests for the identification and estimation of adulterants.

At least one wax dealer has been offering the I. G. waxes E and OP. Many wax paste manufacturers will be interested in OP wax for its excellent paste forming properties. Re-establishment of OP in paste and shoe polish formulation depends of course on steadiness of supply and price.

STEADY DEMAND

Oxidized and de-oiled microcrystalline waxes have achieved a steady and substantial demand as low cost materials in the family of polishing waxes. The continued high price of shellac has resulted in its being widely displaced by synthetics and loba C copal.

A unique new material being studied by many for application in self-polishing waxes is an extremely fine particle size silica dispersion. This product mixed with wax dispersions exerts a favorable effect on gloss and in many tests produces a definite improvement in slip resistance.

RESIN WAXES

Water and solvent solutions of resins are achieving increasing popularity as floor polishes as evidenced by the large number of brands of this type item now appearing on the market.

The Federal Trade Commission's move to investigate and regulate practices in labeling and advertising claims as regards wax polishes are as usual greeted by mixed acclaim and dismay on the part of manufacturers. Blatant claims for durability, slip resistance, carnauba content, etc. will probably need toning down.

An excellent answer to the problem of evaluating slipperiness appears to be contained in the Impact Pendulum Slipperiness Tester devised by P. A. Sigler of the National Bureau of Standards. This device is now coming into general use and, it is felt, provides a satisfactory guide for

developing safe coatings and polishes for walkaway surfaces. The extremely competitive floor wax market has more than ever necessitated emphasis on accurate evaluation of end use performance properties so that formulation development can be intelligently directed towards improvement of those properties considered important by the consumer.

RUBBER CHEMICALS

by WALTER J. GELDARD,
Naugatuck Chemical Division,
United States Rubber Co.



THE level of rubber chemicals business can be quite accurately gauged by the level of rubber consumption. In 1947 the U. S. A. consumption totaled 1,266,527 long tons of rubber hydrocarbon, including reclaimed rubber figured as 50 per cent rubber hydrocarbon.

It now appears that rubber consumption in 1948 will be at about the same level as in 1947. Reliable estimates of overall rubber chemical consumption are almost impossible to make. One method of obtaining a figure is to assume that every 100 pounds of rubber hydrocarbon requires 1.8 to 2.0 pounds of organic rubber chemicals during the process of fabrication into products. This figure does not, however, include reinforcing agents (largely carbon blacks), fillers, plasticizers and extenders.

CONSUMPTION DIPS

It is anticipated that the present high level of rubber chemical consumption will continue until a point of saturation in consumer goods is reached. A slight dip in volume this year is the result of two factors: increased use of natural rubber, which requires smaller amounts of antioxidants and curing agents, and a sharp drop in the export market as a result of a scarcity of dollars in all foreign rubber manufacturing countries.

Increased costs of raw materials, labor and transportation have forced up the prices of antioxidants and a few special rubber chemicals. These prices are still below the 1942 levels. In general there has been no change in accelerator prices following the reductions effective in July, 1947, and January, 1948.

Lines of antioxidants, accelerators and plasticizers have changed very little in the past year. No outstanding new chemicals have been introduced and there has been very little change in volume use of the established products.

Probably the two most important developments of the year, with respect to their effects on rubber chemistry, have been in the fields of carbon black and synthetic rubbers.

FURNACE BLACK FUTURE

We have seen in recent months the commercial production of improved fine furnace blacks. These blacks, made from petroleum raw materials, are intended as replacements for easy processing channel blacks as reinforcing agents in tires and other products. The supply of channel blacks has been threatened by indications that certain states may further restrict their production on the grounds that it constitutes a wasteful burning of natural gas. Furnace blacks give higher yields from the basic carbon compounds used.

Successful development of the fine furnace blacks is particularly significant in connection with a new type of GR-S synthetic rubber, also brought into prominence this year. GR-S polymerized at freezing temperatures (zero to 41 degrees F.) has been found to possess superior physical properties, particularly outstanding tire tread wear. It appears that these improved properties of low temperature rubber are further enhanced in large measure when compounds are made with the fine furnace blacks as reinforcing agents.

Considerable research is now in progress to develop curing agents to take best advantage of the new furnace blacks in both synthetic and natural recipes.

DISINFECTANTS

by ADRIEN S. DuBOIS,
Chief Chemist,
Fuld Bros. Inc.



DURING the past year, research on disinfectants has tended toward consolidation of existing knowledge, and hence, little of exceptional interest has been brought forth. As in the more immediate past, the high-molecular quaternary ammonium compounds have received most attention, probably due to their comparative newness. There have been a few disquieting reports relative to their performance for sanitization purposes, but these are apparently contradicted by the wealth of accumulated evidence which indicates quite general acceptance of their value in this field. In contrast, practically no research work was reported on pine oil, phenolic, cresylic, chlorine and other types of disinfectants. Quite likely, their long acceptance and widespread popularity account for this dearth of new information. There is, nonetheless, a real need for fundamental work to be done with at least some of these older types, particularly those requiring elaborate and often difficult formulation.

NEW EVALUATION METHODS

What appears to be the most significant contribution of the year in research on disinfectants pertains not to disinfectants themselves, but to the method used for their evaluation. The generally accepted procedure of the Food and Drug Administration has been very severely criticized in recent years, particularly as it applies to cationic germicides. The results of a cooperative study by the N.A.I.D.M. (National Association of Insecticide and Disinfectant Manufacturers) Scientific Disinfectant Committee and the U. S. Department of Agriculture have led to adoption of somewhat modified procedures which permit a better, more accurate evaluation, especially of new germicides.

The situation obtaining in the research field is duplicated in the industrial marketing of disinfectants—little of great importance has appeared on the market in the past year. The older disinfectants, such as pine oil and cresylic are still enjoying a very wide market. The new cationic germicides are still expanding their volume, but at an apparently slower rate than in previous years. Several manufacturers have added these to their lines within the last year. The introduction of the quaternary ammonium germicides did create a stir in the disinfectant industry, but the extensive research which it prompted has led to a more stabilized situation, and it now appears that the various types of disinfectants have each found their particular niche where each exhibits particular merits.

QUATERNARIES WIDEN SCOPE

Probably, the most important development in the marketing field, is the acceptance of quaternary ammonium compounds for use in the food industry, particularly the meat industry. This development, which was long in the making, certainly fills a long-existing need.

A most interesting trend has developed during the year, which although it is not based on new products, is of great potential significance. It pertains to detergent sanitizers, a combination of detergents and germicides for use primarily in the restaurant, dairy and related trades. This development was made possible by the relatively recent availability of both

cationic germicides and non-ionic detergents. The purpose of such products, both liquid and powder, is to combine cleansing and sanitizing into one operation, thus effecting a considerable saving of time and labor. When this type of product was first introduced a few years ago, its use met with vigorous opposition from a large segment of public health officials. Now, it appears that this situation is changing, and that at least some officials, particularly in certain sections of the country, are encouraging the use of these products.

HOUSEHOLD INSECTICIDES

By G. ALLEN MAIL,
Entomologist, Boyle-Midway, Inc.



ONE of the major developments in household insecticides during the past year has been the low pressure aerosol insecticide. The high pressure aerosol bomb which became so popular when first introduced was relatively high priced, which somewhat limited the market. Aerosol dispensers of the beer can type, containing a mixture of Freon 11 and 12 with a pressure less than 40 pounds, can be marketed at about one-third the price of the high pressure bombs and insecticidally they are just as effective. In recognition of these factors, several of the major manufacturers now have low pressure aerosol insecticides on the market. Their wide acceptance by a public which appreciates the low price, convenience of operation and insecticidal efficiency would lead one to anticipate that they are here to stay.

CHLORDANE EMULSIONS

Another significant development in household insecticides is the appearance of aqueous suspensions or emulsions of Chlordane to be used as a spray, not only inside the home but in the garden. While a year ago there were only two or three satisfactory emulsifiers which could be used as Chlordane solubilizers, at least four more are now available, all of which do a satisfactory job of making an aqueous spray of permanent stability. Many pest control operators now make up such sprays for use in their professional activities and one of the largest insecticide manfacturers in the country is marketing, with considerable success, a 2% Chlordane aqueous spray under the name of Antrol Ant Spray. Water-based insecticidal sprays possess many advantages over oil-based sprays, not the least being the absence of fire hazard and, when used in the garden, the lessened danger of phyto toxicity.

Aqueous Chlordane sprays have proved to be highly efficient in eliminating Japanese beetle grubs, which have hitherto constituted a very difficult control problem.

While government authorities in Washington are, so far, reluctant to endorse the use of Chlordane in livestock sprays, many thousands of dogs have been successfully treated with 0.5% Chlordane emulsions without ill effects. Perhaps with the advent of Chlordane sprays and dips having a water base and having no kerosene in the formula, the objections to the use of this toxicant for livestock will be less strenuous. However, in spite of official reluctance to endorse the use of Chlordane in livestock sprays, several manufacturers have this year placed on the market Chlordane emulsion concentrates for treatment of dogs.

Chlordane has proved to have exceptional merit in control of roaches, and the past season has seen the introduction of many Chlordane roach sprays. These usually are formulated with a Chlordane content of 2% in a deodorized oil base. These sprays possess a marked residual effect so that their use in infested premises only once a month is sufficient to ensure freedom from these highly obnoxious pests. Where a fire hazard exists, 2% Chlordane water-based sprays are being recommended.

A recent trend on the part of both regulatory agencies and manufacturers is to reduce the DDT content of space sprays, most of which now contain 5% DDT. It is obvious that when as little as 0.25% of DDT in a spray will ensure a 100% kill of free flying flies in a room, there is no advantage in continuing to use 5%. With only a fraction of a percent DDT, no auxiliary solvent will be required and deodorant problems will be simplified. Furthermore the spray definitely will be less toxic.

At least one firm is marketing a novel device for diffusing DDT throughout a room by heat. This consists of a perforated cylinder coated with 45% DDT in an undetermined base which is clipped over a light bulb. It is claimed that the heat from the bulb causes the DDT to vaporize, not only killing insects attracted to the light and flying about the room, but also in course of time depositing an effective residual deposit on the room surfaces.

In garden insecticides, dusts and sprays continue to be about equal in popularity. Rotenone still is a valuable and widely used toxicant in both dust and spray formulations. Combined insecticidal and fungicidal dusts are being stressed, the insecticide usually being rotenone or a rotenone-pyrethrum combination.

HOUSEHOLD SPECIALTIES

by DOROTHY A. NEIDIG



IN the field of household specialties, a few superior new products were introduced somewhat cautiously during the past year. Since packaging materials and chemicals from which these specialties are manufactured were both readily available, this reticence in marketing new products may be attributed to several causes: (a) a general "trying out" of the market after a rather long seasonal slump in buying, and (b) a trend to bring up to standard or improve products already established in a manufacturer's line in an effort to overcome some remaining customer resistance to buying mediocre cleaners produced when raw materials were short.

"GLASS WAX"

One of the best products placed on the market and one for which there is considerable demand is a new type of window cleaner. It is an entirely new merchandising idea in this field. This "glass wax" does an excellent cleaning job and imparts a luster to the glass; however, what the new cleaner gains in efficiency of action it loses in convenience of application since it is necessary to use two cloths, one to apply the wax, another to polish. Further, this product is one of the most superior silver and chrome polishes now on the market. Silver cleaned with the "glass wax" not only has greater luster but seems to retain a protective coating.

Although the increase of the number of "glass wax" type cleaners being offered has resulted in some price cutting, the price is comparatively high. This leaves much of the glass cleaning market to the abrasive and solvent type products.

DETERGENTS GAINING

Synthetic detergents are still gaining in popularity for their performance in dish washing and laundering wools and fine fabrics. The most significant development in this field, however, is the use of carboxy methyl cellulose in combination with these surface active agents for laundering cottons. Excellent results both in soil removal and whiteness retention, are obtained.

In the field of spot and stain removers, one emulsion type product has been placed on the market. This product removes both water and oil soluble spots. One formulation disadvantage which this product seems to have overcome is hydrochloric acid formation in the cleaning fluid on prolonged standing.

THE NEW LOOK

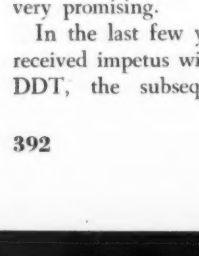
A few established cleaners have appeared in new containers or with new applicators. Notable examples are: a good brand of furniture cream wax polish now provides a polishing cloth; a cleaning fluid now comes in a bottle with a brush top applicator which helps loosen the dirt and through which the solvent flows; a rug and upholstery shampoo is now packaged in individual envelopes for convenience in measuring.

Household tints and dyes have been perfected to include most of the new fibers. Of course, new and seasonal shades are constantly being developed.

Refrigerator deodorizers have also appeared in several different forms. Almost all use activated charcoal in some way. One new product provides a block of activated charcoal on top of a refrigerator dish. This block may be removed at intervals and heated to reactivate it.

AGRICULTURAL CHEMICALS

by R. H. WELLMAN,
Head, Biological Research Division,
Carbide & Carbon Chemicals Corp.



THE rapidly expanding use of 2,4-D in weed control work has been perhaps the biggest factor this year in the steadily increasing amount of agricultural chemicals sold. Other weed killers are also receiving great interest. In this list would be included 2,4,5 trichlorophenoxy-acetic acid, the dinitro phenols, pentachlorophenol and the trichloro-acetic acid salts. The stimulation of this market is caused by the combination of more effective materials and higher labor costs. It may well expand to a size larger than the combined insecticide and fungicide market. Pre-emergence weeding (the application of the chemical following seeding but before emergence of the crop) is the newest approach to this problem and one that seems very promising.

In the last few years, insecticides have received impetus with the development of DDT, the subsequent introduction of other chlorinated hydrocarbons and the more recent development of tetraethyl pyrophosphate and parathion. This period of introduction of new materials is now being replaced by a period in which the problems of how and where best to use these materials is coming under much more careful scrutiny. Problems of toxicology, residue removal and plant injury are being closely studied. It would seem that these studies will lead to an expanded total use of insecticides in the future. In research, emphasis is now being placed on the development of insecticides which are less toxic to warm-blooded animals.

FUNGICIDES

In the fungicidal field, the expansion of the number and uses of the dithiocarbamate family of fungicides continues to be a major development. Within the last two years zinc ethylene bis dithiocarbamate and zinc dimethyl dithiocarbamate have both found substantial markets. 2-Heptadecyl glyoxalidine, at this date, seems the best new material for control of apple scab. Zinc copper chromates are demonstrating their advantages in potato disease control work, particularly for the control of early blight. The introduction of new cotton seed disinfectants such as zinc trichlorophenate is another important development.

For years attempts have been made to keep the tops of plants in perfect condition. Now attention is also being paid to the roots. That roots can be protected from certain pests is evidenced by the use of ethylene dibromide and D-D mixture in controlling nematodes. Wireworms can be controlled with benzene hexachloride (though care must be taken to avoid undesirable taste development in the crop). Soil fungi take their continued toll and no satisfactory control has yet been devised. This is a field of promise for the right chemical.

THE FUTURE

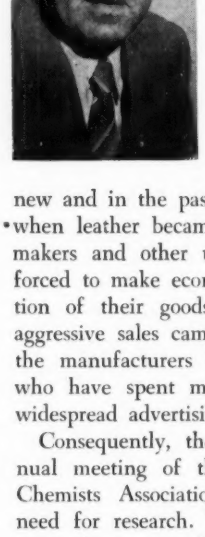
The future of selective weeding is bright provided new and better materials can be found. The goal in many instances would be to have a chemical which would kill all plants but one. That one survivor would be the crop in question which should not be interfered with in any way.

Still further in the future, perhaps, is commercial development of growth substances which will control growth processes of plants in desirable manners. Perhaps it will be possible to delay blossoming until the frost-free period is past, or force blossoming and fruit set to coincide with the most favorable market.

Thus, in addition to the expanding known markets, it is possible that entirely new markets may be opened up by the advent of a new chemical with the desired properties.

LEATHER CHEMICALS

by HAROLD G. TURLEY,
Rohm & Haas Co.



A NEW note appeared in the leather industry during the past year. This is a final realization of the need for research in leather possibly occasioned by the mild alarm at the increased use of substitute materials for leather. The use of leather substitutes is not new and in the past has been stimulated when leather became costly so that shoe makers and other users of leather were forced to make economies in the production of their goods. There is now an aggressive sales campaign on the part of the manufacturers of leather substitutes who have spent much on research and widespread advertising.

Consequently, the keynote of the annual meeting of the American Leather Chemists Association in June was the need for research. The leather industry, apart from a small support of its own Leather Research Laboratory, has seemed content to rely on the auxiliary supply industries for new materials. In many cases this has been a very profitable undertaking for the suppliers, but it is not a healthy condition for the leather industry. The more enlightened members of the chemical supply business realize this.

SYNTHETIC TANS

During the period under review, there have been several very promising developments. When the price of Quebracho arbitrarily was raised 50% by the Argentine government in March, the tanning industry realized with a shock its dependence on foreign sources for its basic raw materials. Fortunately, for the first time in the U. S. A. there were at hand (thanks to the chemical industry) some substitute synthetic tanning materials that could satisfactorily replace the imported tans. Although the synthetic products are still comparatively expensive, their use has expanded and as the tanning industry becomes more familiar with them, it is finding that these homemade products possess certain properties by which superior leather can be made.

Realizing the significance of such strategic materials the U. S. Army through the Quartermaster Department is conducting an experiment with shoes in which for the first time the soles, insoles, and uppers, are tanned with domestic synthetic tanning materials. The currently

available product, Orotan of the Rohm & Haas Co., has been selected for this work, and sole leather will be made by it in the same way as sole leather is today made from the natural vegetable tannins. Apart from this work, this particular product is being used today on almost every type of leather produced.

In tanning, there are several progressive developments. The duPont Co. has introduced a tannage based on aliphatic hydrocarbon sulfonyl chlorides—the product is named Skelt. Such products were used in a limited way by the Germans to produce substitute "shammy" leathers. The parent products are aliphatic hydrocarbons from the Fischer-Tropsch synthesis, processed by the American Reed process using sulfur dioxide and chlorine under the action of actinic light to produce the sulfonyl chlorides. These materials can be made in large quantities from domestic raw materials. The duPont Co. has stated that at present these products are suitable only for light thin leathers, but with further research it is thought possible that they will make plump leathers of better dyeing qualities and better water resistance. Very recently another synthetic tanning material based on resinous polymers of glyoxal with urea or phenol and formaldehyde has been announced by the Planetary Chemical Co.

ZIRCONIUM TANNAGE

Zirconium tannage continues to be used on an expanding scale especially for the production of fine quality light leathers. This distinctly American development is now attracting the attention of European makers of fine white leathers. For example, the British tanners with the dreary days of the war fading into the past are seeking to produce attractive bright white leathers in spite of the austerity conditions under which they have to labor. New applications of zirconium tannage have been extended to white splits and glove suedes.

The pasting method for drying leather, a unique American contribution to leather technology, continues to expand and a number of new pasting machines have been installed. This method also is being introduced into Europe and South America. Tanners today are offered a wide variety of plates upon which the leather is pasted. These may be made of glass, enamel, aluminum, composition boards, or stainless steel. Each of these has some peculiar characteristic which influences the adhesion of the leather, and the choice of a suitable adhesive is of great practical importance. Recently, synthetic adhesives have begun to be used in significant quantities.

In the finishing of leather, new materials are coming into use. After World War I, which saw the introduction of nitrocellulose to the coatings industry there was a tremendous expansion in lacquer manufacture for the fast painting of automobiles, and adoption of lacquer finishes for leather followed. As World War II made greater demands for better quality and performance, new materials were introduced to take the place of nitrocellulose. Such materials are polymeric products based on acrylates, vinyl chloride, vinyl alcohol, and various copolymers. Also as a postwar development of the synthetic rubber industry, Buna N-based coating materials of improved performance have been successfully introduced and are supplanting natural rubber latex in this field.

INDUSTRIAL ADHESIVES

by CHARLES B. HEMMING,
Chief Chemist,
United States Plywood Corp.



THE bewildering array of new adhesives available for all purposes for which adhesives have been commonly used in the past and for many new uses too, seems to be an outstanding development of the past year. It is believed that this is a transitory period between active development of materials and applications on the one hand, and unprecented use on the other.

For a clear understanding of the subject it is helpful to think first, in terms of the field of usefulness, and second, in terms of the durability required for a particular use within that field. The specific chemical classification of adhesives can be left for more leisurely consideration. There are good reasons for this. Most adhesives have tended to become complex proprietary mixtures and even many of the simpler and well-known standbys have been modified in many cases. As a result, they frequently no longer fit into specific chemical groups and many are borderline between two groups.

LARGE FIELD

Wood. The bonding of wood to wood constitutes one of the largest applications for adhesives. Despite thorough exploitation of the field, there have been advancements. The increasing use of radio frequency, electrostatic heating to shorten "clamp time" and reduce floor space requirements is bringing about a more careful study of the needs of the process. Improved understanding has reduced the tendency to "boil" the glue line in attempts to attain unreasonably short cures, and bond quality is correspondingly improving. Adhesives are being formulated specifically for the task, making them more reliable and less subject to burning. Older adhesives are being reevaluated for this specific use, and in many cases are being found suitable.

COLD SETTTING

One interesting new adhesive, although it is cold setting, does not produce glass-hard glue lines and gives exceptionally long assembly times so useful for large assemblies. It is based on furfural. Latex techniques have been extended to a variety of synthetic resins which are not elastomers. These latices in turn have been found useful in a variety of wood bonding operations where indoor durability only is required and where convenience of use in very important.

Phenol-resorcinol resin adhesives are worthy of mention principally because of advances which have resulted in lowering prices in a period of rising markets. Moreover, this has been accomplished without adversely affecting the setting time. An interesting modification having very fast setting time (as short as ten minutes) achieved while maintaining a thirty-minute open assembly time, has resulted from separately catalyzing two modified resorcinol resins, applying one to one surface to be joined and the other to the other surface. When the two are brought together, they react rapidly.

LATICES FOR TACK

Paper, Fabrics and Leather. In this field the modified latices have, of course, been particularly useful, and the almost endless ability to formulate them to accomplish specific results has in part produced the profusion of adhesives mentioned earlier. Ability to introduce tackiness into these adhesives has been studied particularly, and of course, has been an important need. Modifications of the synthetic-rubber cement field having very high tack have recently appeared.

Metal. Advancements in the adhesion of metal to metal have been more in understanding the nature of adhesion and of surface chemistry than of new formulations and resins. Still, there have been some very new materials offered in at least semi-works quantities. Improvements in techniques have resulted in higher bond strengths, greater reliability and in some cases greater simplicity.

Bonding of dissimilar materials. A by-product of the development of good adhesives for bonding metal to metal has, of course, been the ability to bond metal to all sorts of other materials, as well as a wide variety of these materials to themselves and others. In fact, there remain very few materials that cannot at least be bonded to themselves with adhesives. In the cold bonding field where the final as-

sembly must set at room temperature, improvements in adhesives and procedures are reducing the hitherto difficult two-step bonding process to an "every day" procedure. In two-step bonding, for example, metal is primed with a thin adherent film of one adhesive, which upon setting permits the metal to be assembly bonded to another and totally different surface with a second adhesive. An important example is the priming of metal with one of the metal-to-metal adhesives and then bonding the metal at room temperature to wood, plastics and even other metals, with a resorcinol adhesive.

A new modification of the better metal-to-metal thermosetting adhesives permits the adhering of brake linings to brake shoes for automobiles and airplanes.

Some of the new high-tack synthetic resin adhesives are useful in this field especially where one of the materials to be adhered is limp and flexible or where stresses are either very low or are of the shock type and of short duration.

POLYESTERS PROMISE MUCH

Polyester resins with their outstanding advantage of being capable of transformation from a liquid to a solid without benefit of volatile solvent are being found increasingly useful for bonding glass fiber cloth laminates to themselves.

Many older adhesives, natural and synthetic, are due for considerable improvement in performance and expanded usefulness as a result of the very recent availability of isocyanates and Werner-type chromium complexes which can convert thermoplastics into thermoset materials, and water-soluble into water-insoluble adhesives. The broader availability of trioxane and glyoxal has been useful.

Organosols and plastisols developed primarily for coatings in which little or no solvent is present are interesting for adhesive purposes, particularly in combining operations where at least one adherend is a flexible sheet.

BASIC RESEARCH

New techniques. In the fore part of this discussion, certain new techniques have been touched upon. It should be mentioned that important work has also been done on the proper place and use of extenders and fillers, particularly to gain advantages of special performance without harming quality by overuse to achieve low costs. It is also basically important to the future of adhesives that serious study has been given to the problems of adhesion and surface chemistry, the cleanliness and correct preparation of surfaces to be joined, and the use of fillers to achieve a better "mechanical" match of physical properties between adhesive and adherends rather than just as diluents. These studies which frequently go unsung form the basis of tomorrow's new ideas and improvements.

TEXTILE CHEMICALS

by RICHARD E. SUMNER,
Manager, Textile Resin Dept.,
American Cyanamid Co.



PROGRESS in the application of chemicals to improve the qualities of textiles has been marked during the past year. The outstanding development has been the entrance into the cotton market of chemical wrinkle resistant finishes. Until recently the technical problems involved prevented this development, potentially one of the most important in the whole field of textiles

Cotton, as every woman knows, has been a difficult fabric because the lack of resilience in the fiber led to its quickly crumpling and creasing. The chief problem which has prevented application of wrinkle resistant finishes in the past has been loss of tensile strength which was difficult to control in resistant finishes. Today, however, this difficulty has been overcome and the cotton market is moving rapidly to learn how it can best take advantage of resin finishes which give resilience and consequent wrinkle resistance to cotton. This new development comes at a timely moment since there has been some slacking off in the market for cottons. It is thought by cotton manufacturers that the new finish may give them an improved competitive position.

GREATER ACCEPTANCE

Next to successful crease resistance for cottons, the outstanding development has been the tremendously increased acceptance of these finishes to improve the functional qualities of textiles. There is scarcely a textile company today that is not at least actively experimenting with one or more available finishes.

This means that at last the industry is fully accepting the concept of finishes applied—not alone to improve the appearance of the fabric—but to give it improved wearing qualities. These hidden values become evident when the consumer uses the cloth.

In the wool field the growing importance of washability is underscored by the Federal Trade Commission's interesting itself, at the behest of chemical and textile industries, in the advertising and promoting of washable wools. There is general belief that clarification of terminology and restraint of over-enthusiasm will be highly beneficial to the long range development of shrinkage control for wools.

Obviously a considerable educational job still has to be done with the cutting-up trade, retailers, and the general public before the business possibilities of all the new finishes can be fully realized. It is important that a positive educational task be inaugurated to prevent the spread of exaggerated impressions and erroneous ideas as to what these new finishes accomplish.

FIRE RETARDANTS

There has been considerable research and development in the fire retardant finishing field, and satisfactory finishes for lightweight fabrics are now widely available.

An anti-static agent for mills has been announced, thus helping to solve a long vexing production problem of static electricity which has been a source of annoyance both to the weaver and finisher.

The American Association of Textile Chemists and Colorists has been particularly active this year in developing standard test methods for many types of finishes including water repellents. This is another indication that these new finishes to improve textiles have passed the pioneering stage and are being integrated into the textile industry. The FTC is in the process of formulating fair trade practices for water repellents. The year ahead will undoubtedly see further refinements, improvements in finishing techniques, and perhaps some totally new developments.

INDUSTRIAL CLEANERS

by DONALD PRICE,
Technical Director,
Oakite Products, Inc.



THE trend, reported last year, toward more widespread use of mechanical methods in industrial cleaning has continued at an accelerated pace under the impetus of increased production in almost all lines. Such operations as steam cleaning where a combination steam and detergent is discharged at a high velocity against soiled surfaces, as well as various flow-on and spray methods of applying cleaning solutions, conserve materials and greatly increase efficiency.

The tendency, also noted last year, to investigate the basic factors underlying detergency has been intensified. It is well to recognize that the field of industrial cleaning is one in which the technology and practical applications have far outstripped the advances in our basic theoretical knowledge. This is becoming

more widely recognized not only by the manufacturers of cleaning materials, but by technical and scientific groups.

The American Society for Testing Materials has committees actively engaged in the study of such questions as what constitutes a clean surface and of methods of evaluating the effect of cleaning processes upon the quality of the final finish applied to a metal surface. The Research Committee of the American Electroplater's Society is engaged in setting up a project to study the fundamental factors involved in metal cleaning prior to electroplating.

CHEMICAL DEVELOPMENTS

Developments in the chemical industry necessarily affect industrial cleaning. New industrial processes give rise to new types of soils, the removal of which presents new problems. The removal of DDT and the other newer insecticidal spray residues may be cited as an example. Chemical advances, particularly in petro-chemicals, have also made available new solvents of decreased toxicity and lower evaporation rates which permit the development of a wider variety of improved solvent emulsion cleaners. So-called di-phase cleaners in which a solvent phase and an emulsion phase exert cleaning action simultaneously are establishing a recognized position.

One of the difficult problems of industrial cleaning has been the adverse effect of various hard waters upon the action of cleaning solutions. This problem has stimulated much research in the field of the new polyphosphates and has created interest generally not only in these compounds but in organic lime sequestering agents. This fundamental research has thrown new light on the mechanism of lime sequestration.

SANITATION LENDS IMPETUS

Increased attention to the manifold problems of sanitation on the part of health authorities has led to increased activity in this phase of industrial cleaning. Quaternary ammonium compounds of various kinds and in various combinations continue to be used extensively for sanitizing purposes. Combined detergents and sanitizers are also arousing interest. Fruit and vegetable washing with solutions containing surface active agents has been extensively applied and has been found especially valuable in the processing of packaged vegetables, not only from the standpoint of sanitation but of eye-appeal.

The production of surface-active agents of every class has greatly increased and a substantial proportion of this increased output finds its way into the industrial cleaning field. New developments in the field of the non-ionics, the most recent class of surface-active agents, have been especially notable. It has been found, however, that the action of surface-active agents is much more specific than was at first believed; one type of surface-active agent cannot be indiscriminately substituted for another in a given cleaning compound without altering its performance. In fact, it is well recognized that careful selection of wetting agents and proper balance of ingredients are necessary in designing a material with which to perform any given cleaning job successfully.

The outlook for the future is for intensified research in the problems connected with industrial cleaning and for a consequent wider recognition of the importance of cleaning as an industrial process.

PROTECTIVE COATINGS

by MAX KRONSTEIN,
Research Associate,
Adj. Associate Professor,
College of Engineering,
New York University



THE year which has passed has seen the varnish, paint and lacquer industry pass the billion dollar sales mark for the first time in its history. In the industry itself, the present period is characterized by movement into the open market of wartime improvements developed in factories, shops, laboratories and research centers. It is sometimes confusing to the man in the field to be confronted with so many new synthetic resins and modified oils and pigments and tests and machinery. The fact that this industry has been growing so rapidly in recent years has made it an attractive goal for the manufacturing chemist, and more and more companies are entering the field as suppliers. New faces, new names, new trademarks, and new slogans have made it sometimes hard for those in the coating industry to evaluate all the new products.

NEW TRENDS

Significant among these developments are new forms of alkyd resins, new forms of vinyl compounds, and modifications of oils and alkyds with styrene, such as the so-called styrenated products. Silicone paints have come to the market in new forms. A resinous synthetic polyhydroxy-alcohol has been introduced as an "Epon" which, by heating with fatty acid, forms new esters of a basic chemical structure similar to the fatty acid esters of polyhydroxy-alcohols which we knew generally as natural and synthetic oils. These are but a few.

One of the trends in establishing new kinds of coating systems may be seen in the following: By condensing polyvinyl alcohol and butyraldehyde in the presence of alcohol and an acid catalyst, a product is obtained which can then be precipitated with water, and which, after drying, is used as a polyvinyl-butyral resin. It still contains about 7% hydroxyl groups. This resin is used in solution (with ketone and synasol solvents) with zinc chromate pigmentation as a primer paint or "wash primer." The new development in it is the addition of some phosphoric acid to the paint material before its application. This increases the bond between the metal and the primer and at least partially insolubilizes the paint within a few hours. Other coating materials are applied on top of this type of primer substance, for instance, other vinyl compounds such as copolymers of vinyl chloride and vinyl acetate.

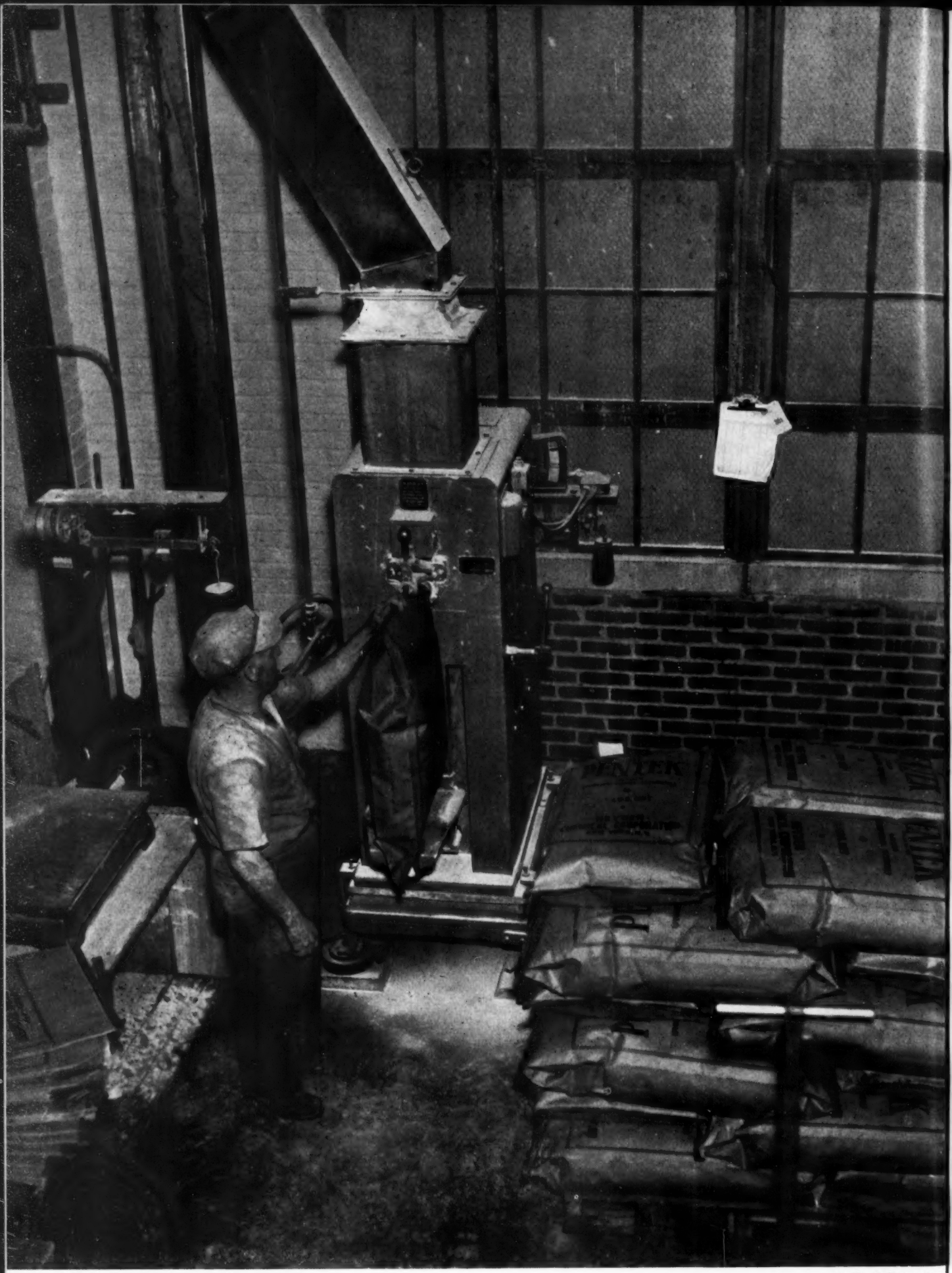
NEW PUBLICATIONS

A considerable number of new and good handbooks have been published in the field. Among these is a Fifth Volume of the late Dr. Mattiello's series of handbooks on *Protective and Decorative Coatings;* new special books on fatty acids and their derivatives—one by A. W. Ralston, another by K. S. Markley; a new *Chemistry and Physics of Organic Pigments* by L. S. Pratt and a new general *Surface Chemistry* by J. J. Bikerman.

GREATER COOPERATION

Greater cooperation and activity has been noted in the professional clubs and associations and in the work of the Scientific Section of the National Varnish, Paint and Lacquer Association. With the increased interest in the field, more factories are improving their laboratory facilities and research activities. Additional professional men are being called for in the industry. Universities also are giving more attention to training young chemists and chemical engineers in the requirements of this big industry. New York University, for one, is active in this field, and, with the active cooperation of the industry, carries on a program of instruction together with paint research under the sponsorship of the U. S. Signal Corps.

In England, France, Holland and Switzerland, the situation is similar and it is interesting that the industries from these countries are beginning to send their delegates to the annual conventions of the American coating industries. These efforts improve cooperation in the world-wide chemical industry itself.



St. Regis Paper Co.

Automatic equipment finds a ready market in a chemical industry that is watching packaging costs.

PACKAGING AND SHIPPING: THE INDUSTRIAL FRONTIER



• RISING COSTS OF LABOR, materials, and freight have forced the manufacturer of chemicals to scrutinize the industrial landscape for ways to combat their effects. Traditionally he has been alert to savings offered by improved processes, better equipment, and labor-saving machines in manufacturing his product. As a consequence, there is less slack to be taken up in those areas, and he has turned to the one remaining frontier—packaging and shipping—to effect economies.

Much was learned during the war in shipping tremendous volumes of goods in containers that had to stand up. These lessons and the further improvements they stimulated have been seized upon to raise the level of materials engineering in the industry. An enlightened management is realizing that greater attention to this aspect of manufacturing will pay off.

Manufacturers of mechanized equipment are aware of the increased tempo of the chemical industry's efforts on this front. They have given their specialized knowledge to solve particular problems, and have found fertile markets. Suppliers of containers, too, have ample evidence of this trend in the cooperative projects being carried on by them and chemical concerns to provide better packaging materials and packages.

Better mechanical equipment to cut down on expensive manpower, lighter and stronger containers, and the application of engineering principles to materials handling problems can reduce production costs and enable shipments to arrive safely. The chemical manufacturer has discovered this industrial frontier and is rapidly exploiting it.

MISCELLANEOUS PACKAGES

by T. PAT CALLAHAN,
Supervisor of Containers,
Monsanto Chemical Co.



THE various containers referred to as miscellaneous packages in the chemical industry have shown considerable improvement in both availability and applicability over the past year. Primarily, miscellaneous packages are containers fabricated from materials other than metal, glass or wood. Chief among those which are to be discussed in this article are multiwall paper bags, fibre drums and fibreboard boxes.

Multiwall paper bags have registered considerable gains, and new uses for this type container are being adopted. The chemical industry's requirements for multiwall paper bags should increase substantially during the forthcoming year. Conventional multiwall paper bags—bags made of straight plies of kraft paper which have heretofore been used—are being augmented by the fruits of the very substantial research program of several large bag manufacturers. This work entails the development of synthetic coatings and synthetic linings for the inside wall of the bag to improve its moisture protective qualities and to prevent contamination of product. The two major synthetics being employed, both as a surface coating and a sheet liner, are polyvinyl chloride and polyethylene.

The ability of fibre drum manufacturers to supply demands during the past year has been very satisfactory, and all indications point to a continuance of this favorable situation. The fibre drum has, in a great many instances, supplanted the slack wooden barrel and has proven to be a very acceptable container to the chemical industry. What is true of multiwall paper bags is also true of fibre drums: considerable progress is being made by drum manufacturers to improve their products by continued developments of various coatings and liners.

FIBREBOARD BOXES

Fibreboard boxes, too, boast an improved position and very favorable supply. Such a condition should prevail throughout the coming year, and this form of package, which has always been very popular in the chemical industry, will continue to be in demand. The success of the fibre box industry in treating fibre to improve its rigidity and strength has been phenomenal, and the fibre box has become as safe a container as any now being shipped. The ever increasing cost of freight transportation, which is a very distinct factor in package selection, favors the fibre box greatly.

COATINGS DEMAND GROWS

As mentioned for both multiwall paper bags and for fibre drums, the development of interior coatings for the elimination of moisture and prevention of contamination has increased the demand by the chemical industry for such products. Various chemical companies throughout the United States have large-scale programs concerned with this type coating and liners. It is

anticipated that mutual working arrangements between chemical manufacturers and fabricators of these coatings and liners will hasten their development so that during the coming year this form of protection for packages will be used to a very large extent.

GLASS AND WOODEN CONTAINERS

by R. W. LAHEY, Head, Packaging and Materials Handling, American Cyanamid Co.



CHEMICAL packaging practices insofar as they concern wooden and glass containers, with one exception, have not deviated much from the pattern of former years. The trend to replace certain wooden containers with packages fabricated from paper, stimulated by shortages created by the last war, has continued at a rate comparable with that in effect during the last few years. The exception to the above trend is the increased demand for metal cans.

GLASS CONTAINERS

The output of glass containers declined slightly in 1947 and is showing a further decline this year, although production levels are well ahead of prewar years.

The 6½-gallon glass carboy bottle developed a few years ago by Owens-Illinois Glass Co. has clearly demonstrated its value as a safe container for liquids. The popularity of this container is rapidly increasing. This bottle, weighing 14 lbs., is machine blown and is designed to stand a hydrostatic pressure of 40 p.s.i. The polystyrene outside screw cap can be equipped with either a venting or non-venting type polyethylene gasket.

Bottles are completely enclosed in wooden cases. Any of the regular cushioning materials can be used but the most popular type is the reclaimed rubber cushion which has proved to be so efficient for 13-gallon carboys.

Announcement of a new line of narrow-mouth oblong bottles by Owens-Illinois during the current year should prove of interest to packers. These containers, called "Shelfline", have been designed to fit the needs of consumers as well as packers and retail dealers. They are made in 3 colors—emerald green, flint and amber. Capacities range from ½ ounce to 32 ounces and only 4 sizes of outside screw caps are required to close all 12 sizes.

It has always been a problem to apply small labels to glass ampules and vials. Methods of decorating glass were developed many years ago but more recently automatic means of decorating these containers such as dry offset printing have been developed. This has enabled pharmaceutical manufacturers to improve the appearance of these small packages and to do away with costly labeling operations.

General Plywood Corp. has developed a plywood barrel which tests conducted by the Forest Products Laboratory have shown to have many advantages over the solid stave tight barrel. This container is fabricated from white oak veneer and bonded with resin adhesives. Staves are fabricated from 3/16 inch 4-ply veneer. A 50-gallon barrel uses 14 standard width staves compared with 30 to 36 random width staves used in fabricating the solid wood barrel. The 50-gallon size weighs 72 lbs. Heads are made of 5 plies of 3/16 inch veneer.

TESTS PROVE DURABILITY

These comparative tests indicated that the laminated-stave plywood-head containers withstood greater compression loads with less deformation, sustained greater internal hydrostatic pressures, withstood greater drops, and throughout the tests resulted in fewer losses of liquid contents than solid wood barrels.

Seymour & Peck, one of the foremost plywood drum manufacturers, is making a combination container which can be used to replace light gauge steel drums for packing powdered materials. This is a timely development in view of the extreme shortage of steel containers. This combination package consists of an inner container of 30-gauge metal usually tinned in a standard outside plywood drum. This drum is fabricated to meet Consolidated Classification Committee specifications in Rule 40. These containers are made in sizes from 2 to 20 gallons and prices are competitive with the light gauge steel drums.

NEW LOADING PLAN

Another development of interest is the work of Frank McGarry of Monsanto for the M.C.A. in the development of a method for staying carloads of carboys with steel strapping. It is expected that this loading plan will soon be published by the Association.

Shippers have received repeated warnings about the inadequacy of their export packages. Reports have been issued by insurance underwriters, carriers, and the Department of Commerce clearly illustrating the damage to foreign shipments that has been caused by faulty packages. This has resulted in an increase in the use of wooden cases for packing foreign shipments. For this reason, considerable attention is being focused upon strengthening by redesigning the various types of wooden cases and crates, including those of the wirebound construction. These investigations include attempts to reduce tare weights.

METAL DRUMS

by PHILIP P. KENNEDY, Consultant, Engineering Department, E. I. du Pont de Nemours & Co.



THE last twelve months have seen relatively few developments in metal drums put into commercial practice. However, several interesting developments have reached the point where successful conclusions may be forecast for the coming year.

A recent innovation has been the use of 8½-gallon stainless steel containers for shipping nitric acid. These containers have been converted from war surplus oxygen "bombs" by "bumping" one end so that the container will stand upright, welding closed the fitting in the bumped end, replacing the fitting in the other end with a 1-inch fitting, and attaching a handle for convenience in handling and emptying drum contents. While this particular container is of novel design, it has focused attention on the use of small containers fabricated of stainless steel, aluminum and other corrosion-resistant materials as replacements for glass carboys. With freight rates and labor costs at an all-time high, the inherently high tare-weight to gallonage-capacity ratio of carboys, and the necessary maintenance make the economic investigation of alternate types of containers attractive at this time. Several drum manufacturers are now working on special designs for 15- and 20-gallon drums which will be carefully evaluated by the chemical industry in the near future.

STAINLESS CONSTRUCTION

In connection with the use of stainless steel containers, one fabricator announced some months ago the commercial production of stainless steel drums with chime construction double-seamed and fillet-welded. The fillet weld, in addition to adding strength to the chime, also allows thorough cleaning of the interior portion of the chime by partially filling the crevice formed between the heads and body of a conventional double seam. The fillet weld is made by a modified Heliarc process and has met with considerable success in its adoption by

users of stainless steel containers. Although this type of weld is currently limited to stainless steel drums, work is being done on its application to containers fabricated of carbon steel.

A radically different type of open-head drum closure, known as the "Howe" closure, has been brought to the attention of chemical shippers during the year. This is a bayonet-type closure consisting of three or more "lugs" or interrupted threads which are expanded *out* of the cover and *in* in the top portion of the drum body. The drum is closed by placing the cover on the body and rotating the cover in a clockwise direction approximately 60°. The top portion of the "threads" in the cover engage the bottom portion of the "threads" in the body. As the threads have a slight pitch, the more the head is rotated, the more the gasket in the cover is compressed and the tighter the seal. This closure has promise of being less expensive than the bolt and lever types of ring seals and does permit much quicker application and faster reseal. Further investigation of the "Howe" closure is in progress.

RESEARCH PROGRAM

Of great interest to the chemical industry was the announcement in January by the Steel Shipping Container Institute of their $100,000 research program on development of coatings for steel containers. This program, established at the Battelle Memorial Institute, Columbus, Ohio, will encompass the entire process of container manufacture starting with the type of steel to be used, surface preparation, coating application and drying, and the development of new coatings. Through the aid of the Manufacturing Chemists' Association, which has established a committee to work with the Steel Shipping Container Institute on this subject, an industry-wide survey was obtained of coated steel containers currently used by the chemical industry, and the potential use of coated steel containers. The results of this survey indicated a potential increase in the use of coated containers amounting to three to four times the present output. This increase is dependent upon improved adherence of coatings to steel and the development of more economical and chemically resistant coatings. While this project is a long range one, it is expected that improvements in coated containers will be noticed as various phases of the program are completed.

A second subject under investigation by a joint committee of the Steel Shipping Container Institute and the Manufacturing Chemists' Association is the revision of the I.C.C. 37 series drum specifications. This subject has been receiving consideration and undergoing discussions for several years. During the past year, considerable progress has been made in crystallizing into a workable program the many ideas for simplifying the present specifications, and in conducting tests. The work so far indicates that considerable simplification may result and that improved light-gauge open-head drums may be expected. Tests have shown that the design and gauge of metal of the locking ring are the most important in the ability of a drum to withstand dropping without leakage. Improved design in locking rings and the use of heavier gauge metal than has been the custom may be introduced during the next year.

HANDLING TRENDS

by RICHARD LORTZ,
Managing Editor,
Shipping Management



DURING the past decade, the accent in industry has been on the refinement of materials, designs, processes and machine efficiencies. As a result, better products are being produced at substantially lower costs.

It is becoming increasingly clear, however, that the resulting savings are very often lost because of lack of consideration in other matters.

For example, studies in many industrial plants reveal that materials handling processes account for as much as 30% of the cost of production. In addition, it has been estimated that the flow of materials through plants and shipping departments consumes an average of 22% of industry's payroll—the largest single labor cost!

AWAKENING INTEREST

That management is at last beginning to realize that it cannot afford to overlook new developments in this neglected field of cost reduction and that it must familiarize itself with every available method of improved materials handling is indicated by the fact that when the second National Materials Handling Exposition opened on January 12, 1948, twice as many exhibitors utilized three times as much space as the preceding year—and the estimated spectator attendance was doubled.

OBJECTIVES

In planning any materials handling operation, the object is to determine how to transport materials in the shortest possible time with the least expenditure of money and energy so as to obtain the maximum productive efficiency.

Efficiency and economy are the means by which all the objectives of a good materials handling program can be obtained. These objectives are:

1. Reduction in cost of handling.
2. Increased plant capacity.
3. Economies in space.
4. Reduced inventory.
5. Improvement of the product.
6. Reduction in handling hazards.
7. Improved working conditions.
8. Facilitation of materials control.
9. Faster delivery to consumer.

EQUIPMENT

Mechanical handling equipment saves time, labor, and space, and makes for better industrial relations. Modern mechanized equipment can load and unload faster than men, handle heavier loads, travel faster and build higher stacks, with great safety, in fewer man hours.

General factors to consider:

1. *Gravity.* Gravity can often be substituted for manual labor or machinery.

2. *Flexibility.* Equipment capable of a variety of operations is more productive than equipment capable of a single operation. Fork lift trucks are more useful than portable elevators because fork lift trucks carry and lift and stack.

3. *Equipment details.* Mechanical equipment does a better job when provided with automatic couplers, non-friction bearings, rubber tires, and other speed-up aids. When hand-operated hook-hitch couplers are replaced by good automatic couplers, the efficiency of trailers increases by as much as one-third.

4. *Dead-weight.* Reducing the ratio of dead weight of equipment to load carried saves time and labor. The lighter the equipment, the less mechanical or manpower needed to move it.

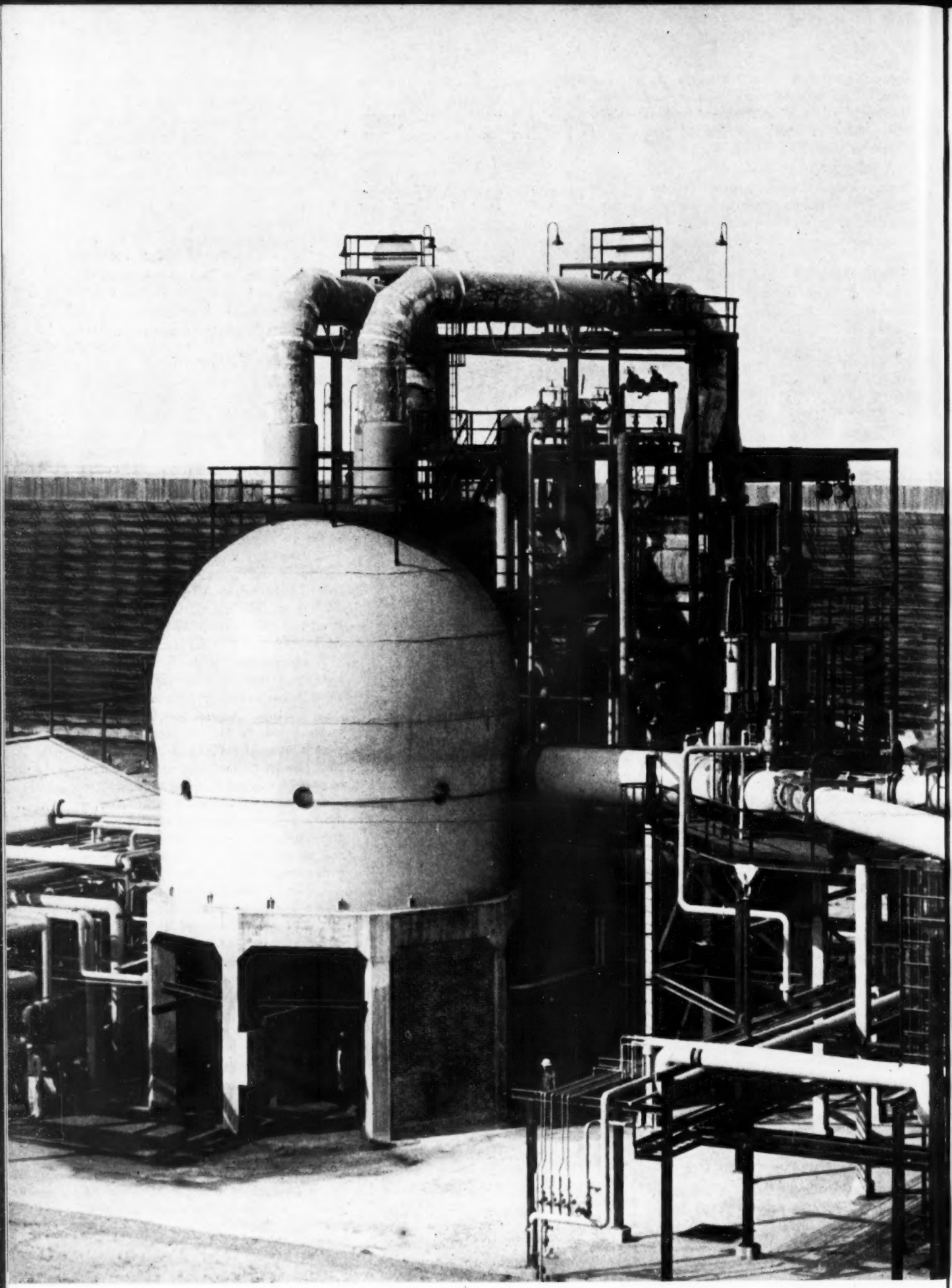
5. *Idle Time.* Equipment is efficient only when it is functioning. A tractor should never be allowed to stand idly while its train of trailers is being loaded.

6. *Standardization.* Determining the best way to do a particular job most quickly and easily, and adopting that way as standard practice establishes good working habits, simplifies and speeds operation.

7. *Maintenance and Repair.* The productivity of equipment is increased and its life is lengthened by anticipating repairs and replacements.

8. *Obsolescence.* Equipment which was efficient yesterday is not necessarily efficient today. If it can be established that present equipment and methods are wasting time, labor or space, as compared to more advanced developments, they should be replaced.

9. *Safety.* All the factors listed above must be balanced against the safety factor. Equipment and methods which risk injury to men or supplies are not efficient.



35,000 barrel per day special vacuum flasher at the Shell refinery, Wood River, Illinois.

EQUIPMENT MANUFACTURERS SATISFY EXPANSION DEMANDS



PROGRESS IN

PROCESSING EQUIPMENT

• LIKE THE BLOCKING backs that make the long gains of heroes possible, equipment manufacturers often go unnoticed in the glamor of industry. When opposing tacklers in the form of "shortages" spill the spectacular new plants for losses, their importance is recognized—though not by shouts of approval. These vital team members are again fading into the background. This means that they are carrying out their function of polishing up old maneuvers, and occasionally coming up with a new "mousetrap play" that enables the team to advance rapidly. Although they are seldom in the head lines, they are always in the lineup.

To say that the past season's schedule has returned to normal would be misleading. It has advanced to what is hoped will be a *new* "normal". Makers of equipment have taken the tougher schedule in their stride, and have met new foes with new offenses. To difficult processing jobs they have brought new and improved designs made possible by a still growing fund of engineering data and better materials of construction.

TO DETERMINE exactly the date any given type of process equipment is introduced is extremely difficult. In fact, the introduction of a device operating on a wholly new principle is a rare occurrence.

In spite of this dearth of wholly new devices, this year, as usual, has seen an impressive number of improvements on those already in use. Notable among these is the addition of highly stable Teflon gaskets and packing to present designs of pumps, pipes and fittings. This has removed many limitations on their use.

Another general development pattern is the application of knowledge gained in making a particular device for a given purpose to the solution of other problems. An excellent example is the application of the fluidization technique, originally developed for catalytic cracking of petroleum, to such diverse fields as lime burning and the roasting of sulfide ores. No matter what the source of the development, the results can and often do equal or exceed in importance the initial advance. There is a reason for this: Much of the fundamental information required for the application has already been amassed. This reduces the time and money to be spent in experimentation.

AVAILABILITY

Before proceeding with a discussion of equipment types it might be well to record the fact that the days of colossal order backlogs are just about over. Conversation with representatives of a large number of the construction engineering companies reveals that the company with a large enough file of orders at this point to keep its staff busy for the next year is a rarity. However, despite indicated development of lessened domestic activity, the companies expect sufficient foreign orders under the Marshall plan to round out a satisfactory total volume of business. When these organization are busy, equipment firms are busy.

Another straw in the wind is the tenor of the replies to the CI questionnaire on new equipment. In the three previous surveys there were always several notes with this general comment: "We're so far behind schedule it looks like we'll never catch up." There were none of these this year.

ADSORPTION

Adsorption for many years consisted of using activated carbon to remove an undesirable ingredient, such as the color of sugar solutions. Today adsorption is a rival of distillation and solvent extraction for many separations. Although it had been recognized for some time that adsorbents could be used for fractionation, the high cost of such techniques held them to laboratory operations, such as chromatography. Well over a year ago the Hypersorption process – adsorption rectification of gaseous materials – was first placed in operation for the separation of ethylene from other hydrocarbons. Today it is being considered for a variety of other separations, such as the production of pure methane and the fractionation of methane and hydrogen chloride mixtures, and the end is not yet in sight.

The advances in adsorption techniques are not limited to the fractionation of gaseous materials. Chlorophyll, xanthophyll, and beta-carotene are being produced from alfalfa by extraction and fractionation in a chromatographic column. The coincidence of rumors and issued patents may indicate that application of adsorption to the separation of the aromatic hydrocarbons from petroleum fractions is just around the corner.

Advances continue to be thick and fast in the use of ion-exchangers for a variety of process operations. New resins provide greater selectivity and permit single-bed operation for removal of both

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anions and cations. Here is another case where availability of a new material permits an important engineering advance. Recovery of alkaloids, purification of molasses before evaporation, and the fractionation of amino acids and rare earth metal solutions are a few of the many applications.

New applications of adsorption techniques generally have constituted the most fertile field for advancement in the separation of materials. They are finding use for both relatively inexpensive materials, such as ethylene, and extremely costly products, such as amino acids.

CENTRIFUGES

The continuous centrifuge still enjoys a widening field of application. It is already well on the way to replacing starch tables for the separation of starch and gluten (CI, Sept., 1947, p. 378). Recently it has been applied to the saponification of fats for the production of soap. One plant is now operating in the United States and several more are believed to be scheduled. Application of continuous centrifuges to this operation has reportedly lowered processing time to two hours, thereby greatly reducing the amount of "nigre", low-grade soap, produced.

DRYERS

Interest in the drying of heat-sensitive materials, sparked by the penicillin and blood plasma programs during the war, has continued. Freeze drying was specified for this operation in the first U. S. plants, but the Danes and Swedes utilized spray drying for all their blood plasma. Recently penicillin too has been produced in Sweden and Denmark by this method (CI, July, 1948, p. 30).

In addition to these applications of spray drying, industry is extending its use to an ever increasing variety of other materials.

Another new drying technique is the process called "squeeze drying" (CI May, 1948, p. 759). Here, the solution to be concentrated is first frozen, and later subjected to pressure to melt the eutectic mixtures formed by freezing. The residue is essentially pure ice.

Still another development is freezing the dilute material on a stainless steel belt moving in a high vacuum. The water vaporizes and the dry powder produced is scraped from the moving sheet by a doctor knife. It should be noted that the so-called "squeeze drying" process is only a concentration procedure and requires auxiliary equipment to produce dry powder.

EVAPORATION

Compression evaporation continues to hold interest, as seen in the recently announced Elliott process for production of oxygen by liquefaction and distillation of air (CI, April, 1948, p. 565). Since this procedure cannot be used where there is any surface fouling or appreciable boiling point rise in the solution being evaporated, it is limited to such operations as the above and to the preparation of distilled water. A steam jet ejector as well as a mechanical compressor have been employed in the compression step.

DUST COLLECTION

Primary interest in dust collectors has been in the separation of the "fluid" catalyst from the vapor stream in catalytic cracking. The latest variant is the use of ultrasonics (high intensity sound waves) for agglomeration of aerosols, finely divided powders or mists suspended in a gas stream. The first application is the collection of carbon black, and more are expected to follow.

HEAT EXCHANGE

Emphasis has been on the development of heat exchangers for operation at very low temperatures in conjunction with the production of cheap oxygen for steel mills, synthetic gasoline plants, chemical plants and other operations. Consequently engineers have sought exchangers capable of recovering the last available BTU. A further push in this direction has been provided by the rising price of fuel and the resultant need to recover and reuse every bit of energy wherever possible.

Use of the regenerative type of heat exchanger such as is employed in oxygen plants is not limited to low temperature operations. This type is an essential part of design in processes using extremely high temperatures as well. An excellent example of this is the pebble type heater, the heat exchanger employed in the so-called Daniels process for the combustion of nitrogen to nitric oxide. The development of a new zirconia refractory in which the inversion in crystal structure that takes place at 1000°C. has been eliminated, and should be of great assistance here.

Molten salts for heat transfer are an old story, but it wasn't until the past year that this medium was available in a packaged unit (CI, Jan., 1948, p. 44). The use of Dowtherm is still on the increase, while initial steps in the marketing of tetra aryl silicates as heat exchange media have been taken.

DISTILLATION AND EXTRACTION

Great interest continues in the development of various types of high vacuum distillation units. In fact, one of the really new devices, the Bowman still (CI, April, 1947, p. 589), permits rectification of the original mixture under molecular distillation conditions. This device should eventually carve out an important place for itself in the distillation field.

Extraction distillation continues to develop, with current emphasis on its use for separating chemicals from the oxygenated fraction of Hydrocol synthetic gasoline. Water is the extractive agent.

DRYERS AND HUMIDIFIERS—New Equipment Announced 1947-8

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*		*Company*
Atomizer	Up to 6 tons wet material per hr.	Stainless steel	Shaft assemblies dynamically balanced, oiling system gravity feed, oil circulation by positive suction	For spray drying installations	Speeds to 20,000 rpm, power to 60 hp.	Bowen Engr., Inc.
Book truck drier	Various sizes	Steel	Extension springs permit easy raising and lowering of individual shelves. Equipped with wheels or castors	Rubber, plastics drying and curing		Palmer-Shile Co.
Continuous conveyor dryer	2′ wide conveyor	Steel or special metals	Uses preforming feed	Pilot plant, low production rate continuous drying of valuable product	50-300 lbs. per hr.	Proctor & Schwartz, Inc.
Gelatinizing roll	36″ diameter 84″ long	Alloy metal roll shells	Built for high bearing pressures, steam pressure up to 225 psig., power range 10-20 hp. Doctor blades readily adjustable and easily removed	Drying starch products containing up to 45% moisture. Wiht liquid feeder can dry 80% moisture material for production of dried milk etc.		Allis-Chalmers Mfg. Co.
Humidifier	Cabinet 13⅜″ x 14¾″		Nozzles individually adjustable so that direction of sprays may be set as required. Automatic opertion, with relative humidity maintained by a humidistat	Will atomize 35 lbs. of water per hr. using 5 cfm. of air supplied at 32 psi.		Spraying Systems Co.
Iustrument air dryer			Air leaving at dew-point as low as −50°F.	Capacity of 12½—250 scfm. at 100 psi. and 70°F. Sufficient for 25—500 air-operated instrument installations		Dehydraire Corp.

Solvent extraction of oil from oil-bearing seeds is not new in itself, but installation of this method of recovery continues apace, particularly for oil from soybean and cottonseed.

PIPES AND FITTINGS

The biggest news in the field of pipes and fittings is the rapid introduction of the war-developed plastic, Teflon, as a packing and gasket material. It is expensive, but its use should provide a complete solution to many heretofore difficult maintenance problems.

Another device promises to reduce the number of gray hairs in the locks of the maintenance engineer. This is a machine which eliminates welded flanges on vanstone type lightwall stainless steel pipe lines. The desired flanges are produced on the end of the tubing by turning over the end without the use of heat. In many cases this will allow repair of pipe lines without the shutdown of a unit that a flame for welding would require.

Welded-type fittings continue to gain in popularity. A new line of fittings permits asembly of a steel piping system by brazing. The method is similar to that used in installing bronze pipe lines.

PUMPS AND COMPRESSORS

The principal trend in the use of pumps is toward multi-staging of centrifugal pumps to develop higher pressures. Teflon is providing a packing with a much longer life, but apart from this new material, there appears to be a swing in favor of mechanical seals. Extremely high pressures still require reciprocating pumps.

The use of rotary compressors is on the increase. These are the heart of the new "cheap" oxygen plants. The steam jet ejector is favored in producing pressures just short of the high vacuum range. An ejector is also used in one of the compression evaporation installations. Although centrifugal compressors are continually extending their range of application, reciprocating compressors for extremely high pressures are still necessary.

FILTERS

The trend in this field is from batch-operated presses to continuous filters. Another important development is the use of filter media woven of various synthetic fibers. The increased resistance to corrosion and abrasion is counted upon to outweigh the obvious disadvantage of higher cost.

GRINDERS

Often the type of grinding equipment is laregly determined by the material to be ground. Consequently an extremely large number of types has grown up. However there has been little activity in the field other than the development of various fine pulverizers. There are now several pulverizers on the market which depend upon attrition produced by particles flowing in the gas stream. One type of jet pulverizer is used to reduce the size of the coal particles for firing the coal-fired gas turbine locomotive. Here a combination of attrition and impact does the job.

MIXERS

This type of equipment appears to be in a state of suspended animation, awaiting development of a more definitive mixing theory. Mixing is largely an art in which the large amount of practical experience available allows design of excellent apparatus. There have been a number of high-shear mixing devices introduced recently and there is some evidence that this may be the area of the next major advance.

INSTRUMENTATION

Use of electronic means of process measurement and control continues to expand. The higher echelons of mathematical theory are being called on more and more in process analysis and even in control. Statistical analysis in particular is coming to the fore. This trend has forced greater use of calculating devices more complex than the slide rule. Similarly, increased familiarity with higher mathematics may well serve as the breeder of many processing developments and rearrange the pattern of control instruments we now know.

DRYERS AND HUMIDIFIERS—New Equipment Announced 1947-8 (Continued)

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*	*Company*
Pilot plant drier	3 ft.³		Versatile and self-contained	Controlled drying —90—350°F. for pilot plant operations	Tenney Engr., Inc.
Spray air conditioner	Occupies 7½ —50 ft.³		Controls provide for holding or varying the conditions of temperature and relative humidity between 40 and 125°F. dew-point with extremely close tolerance	Deliver 2000-20,000 cfm.	Niagara Blower Co.
Spray drier	10′ diameter, 5-20 tons per day production	Steel, stainless steel, alloys	Compact, completely automatic control, 6,000-20,000 rpm., 10-60 hp., single or multiple stage dry product collection or dry and wet recovery, suitable for open or closed cycle operation	Drying chemicals, dyes, pharmaceuticals, combinations of spray drying and chemical reactions. Feed must be pumpable	Bowen Engineering, Inc.
Spray drier	10′, 14′, 18′ diameter	Stainless steel, nickel, monel	Wet collector for high thermal efficiency and low product loss. Liquid to bag or barrel in one step	Heat - sensitive materials. Fluid enough to pump	Swenson Evaporator Co.
Tunnel kiln	2 and 5⅛″ x 3¾″ tray 10″ long firing zone		Trays pushed through firing chamber by variable speed drive. Equipped with automatic temperature control. Operates on 110 or 220 volts AC.	Small batch production work, firing of ceramic parts, heat treating of small parts. Maximum temperature 2200°F.	K. H. Huppert Co.

MIXERS—New Equipment Announced 1947-8

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*	*Company*
Agitator	1-50 hp. drives	Standard and corrosion resistant steels and alloys	Ability to mix a large, long or deep vessel with low power. Can be driven by electromagnet drive eliminating stuffing boxes for pressure vessels	Conversion tubs, precipitate washing, mixing in large vessels. Not applicable to small installations or shallow, dish-like vessels	Walker Process Equipment, Inc.
Continuous mixer	5-1000 gph.		Will handle products ranging from the viscosity and density of bread dough to liquids as fluid as water		Marco Co.
Intensive mixer	1 pt.-275 gal.		Equipped with heating and cooling jackets, incorporates anti-friction bearings with integral gear unit attached to the trough and rotating with it	Processing rubber, linoleum, paints, asphalt compositions	Struthers Wells Corp.

MIXERS—New Equipment Announced 1947-8 (Continued)

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*	*Company*
Masticator	7, 20, 50 gal.	Iron and steel, stainless steel, special alloys	High velocity, more efficient heat transfer, blades draw material into mixing zone without use of compression ram or cover	Compounding of plastics with pigments, fillers	Baker-Perkins, Inc.
Mixer	6 and ¾" base diameter, 14" ht.	Stainless steel bowl, cover and knives	2-speed 1/5 hp. motor	Laboratory emulsions and dispersions	Colloid Equipment Co., Inc.
Mixer—batch or continuous	7½-75 gpm.	Carbon or stainless steel	May function simultaneously for homogenizing or emulsifying while deaerating and dehydrating	Oils, greases, emulsions, pastes ¼" Hg abs. to 15psig., up to 2400 rpm.	Cornell Machine Co.
Mixing kettle	40-300 gal.	Stainless steel	Sanitary construction, agitators easily removed for cleaning, steam jacketed	Chemicals, food, cosmetics	Groen Mfg. Co.
Propellar-type agitator	5-15 hp	Stainless steel and bronze	Cartridge type unit furnished with alarm which sounds if water supply lubricating the bearings fails	Mixing materials of consistancies up to 4%	E. D. Jones & Sons Co.
Side entering mixer	5-30 hp.	Carbon steel, bronze propeller or stainless steel shaft, propeller and stuffing box	Packing in stuffing box can be replaced without emptying tank	Large chemical tanks and oil blending tanks	Eastern Industries, Inc.
Stirrer	1/15 hp.	Monel or stainless steel shaft and propeller	Variable speed gear reduction	Small batches of viscous materials. Open type motor only	Eastern Industries, Inc.
Turbine agitator			Available with pitched or curved blades or combination	For operations requiring high heat transfer rates Viscosities up to 100,000cp.	Industrial Process Engineers

AUXILIARIES—New Equipment Announced 1947-8

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*	*Company*
Adjustable speed motor	3-50 hp.		Stepless speed-adjustment over a 3:1 ratio by turning a dial. Self-contained in housing only slightly larger than that for a constant-speed motor of comparable rating		General Electric Co.
Bench scale			Magnetic rack and pinion engagement, outboard bearing construction	Precision weighing under continuous heavy duty service	Yale & Towne Mfg. Co.
Continuous weigher			Utilizes diaphragm instead of knife-edge-beam for metering flow of dry materials by weight. Cyclometer totalizer reads directly, is non-cyclical, automatically corrected for belt speed variations	Weighs, proportions or controls the feed of one or more dry materials, and controls the flow of liquids in proportion to the flow of dry materials	Builders-Providence Inc.
Corrosion resistant motor	Frame sizes 203-326	Monel, lead and bronze	Explosion proof	AC motor for general application	Reliance Electric & Engineering Co.
Counting scale			Scale is rolled over the items to be weighed and "grabs" are fastened on	Will count pieces Capacity 1000 weighing 1 oz. or lbs. more	National Scale Co.
Counting scale			Counts and weighs small or large parts	Cost control for stockrooms, production and packaging departments	Yale & Towne Mfg. Co.
Crane scale			"Fixed center" construction eliminates possibility of mechanical parts being thrown out of alignment, springless dial	For weighing with sling chains, cables, or other lifting members	Yale & Towne Mfg. Co.
Dial scale mechanism			Straight line relationship between platform load and pointer movement, engagement between pointer rack and pinion by means of a magnet	Industrial loads up to 50 tons	Yale & Towne Mfg. Co.
Dormant platform scale		Steel	Outboard corner support bearings		Yale & Towne Mfg. Co.
Electronic Relay	20 ohms-2 megohms		Long trouble-free life, circuit stable over wide voltage, fluctuations. Heavy contacts, capable of actuating up to ½ hp motor		R-S Products Corp.
Enclosed duplex drives	1-15hp	Iron, steel, any machinable alloy	Totally enclosed bevel gear drives for mixing materials of high viscosity	Process industries For fluid and semi-fluid paste	New England Tank and Tower Co.
Flashlight		Steel-lined neoprene case	All working parts in "sealed-in-head" unit for ease in changing bulb or batteries		Lennan Lights, Inc.
Gas cylinder opener			Fits over cylinder valve handle, tightened in place by a set screw. Main valve easily turned and tightly closed without use of a wrench.		Nutmeg Industries
Gearmotor	3-50 hp		All gears and bearings receive positive lubrication at all speeds, maximum strength and tooth overlap, slow uniform wear. Gear ratio combinations from 7.61:1 to 38.9:1. Equipped with most standard motors.		Westinghouse Fiberglas Corp.
Gloves	10, 11	Neoprene patches	Patches provide positive gripping action in key spots		Surety Rubber Co.
Gridded bearings		Cast lead-tin	Good conformability, embedability, self-healing	Now operated under loads of over 3500 psi. projected area with shafts of 160 Brinell hardness	American Brake Shoe Co.
High temperature insulation	Felt and bulk forms		Unaffected by repeated heating and cooling, and by most acids. Non-corrosive to metals	High temperature equipment, and as filtering element in fly ash separators Up to 1800° F.	Owens-Corning Fiberglas Corp.
Industrial Apron	29" x 35", 35" x 45"	Clear Koroseal film	Resistant to acids, greases, vegetable and animal fats, solvents, soaps		B. F. Goodrich Co.
Linestarter			Overload relay for manual or automatic resetting, magnetic blowouts, rugged magnetic contactor with knife edge bearings. Explosion tested	For use with DC motors up to 5 hp on circuits of 80, 115, 230, 550 volts	Westinghouse Electric Corp.
Motor-capacitor service kit			5 toggle switches are flipped for quickest start within safe voltage limits	Temporary replacement in absence of universal or exact-duplicate capacitor	Aerovox Corp.
Motor starting capacitors	2 1/16" diameter	Steel casing	Compact, protected against mechanical damage, dirt, and climate. Capacitances from 1 to 8.5 mfd., 110, 220, 330, 440, nd 660 volts AC rating		Aerovox Corp.
Multiple-section miniature speed changers	1.050" diameter 3"-4 and 5/8" length		Standard 1, 2, 3 section units with ratios up to 3375:1	Low power speed changing applications requiring high ratios	Metron Instrument Co.
Pipe insulation	18" long sections all sizes of pipe	Cellular glass	Fire-resistant, waterproof, vaporproof, strong, rigid, light, easy to cut and fit	Pipe insulation for hot and cold lines indoors and outdoors —200 to 800° F.	Pittsburgh Corning Corp.

AUXILIARIES—New Equipment Announced 1947-8 (Continued)

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations	Company
Platform scale			Main pivots protected by outboard, corner support bearing construction. Main fulcrum pivots protected by corner load links and auxiliary fulcrum pivots		Yale &Towne Mfg.Co.
Portable platform scale		Steel	Will weigh correctly when thrown off by angles as high as 4°, outboard bearing construction		Yale & Towne Mfg. Co.
Power driver			Self-contained, light, may be operated in any position. Draws power from small blank cartridge	Quickly anchors pipe hangers and conduit boxes to structural plate or concrete with threaded or headed studs	Mine Safety Appliances Co.
Renewable switch		Flexible beryllium strips, silver contacts	Can make or break two circuits simultaneously or one after the other. Cleaning action by flexing movement of beryllium strips	For 10 amps. at 110-125 volts AC	Congress Fan and Electric Co.
Side drives	½-25 hp	Iron, steel, any machinable alloy	Fit 150 lb. American Standard Flanges, tapered roller bearings for gear motor drives and belt drives	All process industries Fluid mixing only	New England Tank and Tower Co.
Sleeve and apron		Plastic	Corrosion and heat resistant, electronically sealed and welded	Where workers can contact corrosive chemicals	Mine Safety Appliances Co.
Squirrel-cage induction motor	200-700 hp	Drip-proof construction, fabricated steel frame	Favorable for across-the-line starting, easy access to bearings	High speed applications	Electric Machinery Mfg. Co.
Synchronous motor magnetic drive			Motor drives ring of magnetic drive at constant speed	Smooth adjustable speed control for centrifugal pumps	Electric Machinery Mfg. Co.
Tablet compressor	Pieces up to 3″ diameter		Vacuum chamber surrounds the die table, punches and feeding device	For feeding and compressing of materials in which entrapped air tends to reduce press operating speeds or cause laminations 20 tons pressure	F. J. Sokes Machine Co.
Tank strapping		Lead covered steel	Studs welded in place on back of strap, lead on strap ready for burning without dressing	For sheet lead lined tanks	Knapp Mills, Inc.
Totally enclosed 3-phase motor	1½, 2, 3 hp		Grease sealed cartridge type bearings	440 volts, 60 cycles	Kato Engineering Co.
Turbine drives	Up to 2000 hp		High allowable steam pressures and temperatures, flexible	Speeds through 6000 rpm., back pressures through 250 psig.	Elliott Co.
Utensils	3,5 gal. pails 2 qut. dipper 10″ funnel 2, 4, 6 qt. measures	Coating of seamless rubber	Coating of soft or semi-hard natural or synthetic rubber furnishes protection from chemical action	Coverings for reinforced, perforated metal utensils	Automotive Rubber Co., Inc.
Variable speed changer	20 hp for 5:1 and 6:1 25 hp for 2:1, 3:1, 4:1		Housing split horizontally		Link-Belt Co.
Variable speed hydraulic transmission	½ hp		Smooth, stepless speed adjustment in either direction of rotation, equipped with automatic overload protection		Vickers, Inc.
Variable speed motor	9″ x 7″ x 5″		Adjustable, stepless speed control from 1500-600 rpm 1/5 hp	Maintains constant maximum torque at all speeds	Guernet Electrical Machinery, Inc.
Welding paste			Confines the flow of molten alloys to the area upon which the weld is to be placed	Applied by painting or spraying for use with low temperature welding rods	Eutectic Welding Alloys Corp.
Wound-rotor motor			Air-to-air heat exchanger, totally enclosed	Driving centrifugal pumps	Allis-Chalmers Mfg. Co.
Wrench		Alloy Steel	Eccentric, instantly reversible jaw automatically grips round, square or hexagonal parts	For application and removal of hard-to-get-at fittings	American Die & Tool Co.

DUST AND LIQUID SEPARATION—New Equipment Announced 1947-8

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations	Company
Collector	13″	Stainless steel	Compact, high efficiency, high velocity	Collection of large quantities of fine materials suspended in a gas or vapor Usually 95% collection or better with 2 in series	C. H. Wheeler Mfg. Co.
Dust control unit	900 cfm. air at 2″ suction		Semi-automatic cleaning operation	Capacity sufficient for 4-3″, 2-4″, or 1-6″ connection	Kirk & Blum Mfg. Co.
Filter		Felt	Can handle dusts containing a high percentage of oil or moisture. During filtering no portion of filter need be cut off for cleaning or shaking	99.99% minimum recovery of most solids. Average filter rate 20 cfm. per sq. ft. of filter surface	Pulverizing Machy. Co.
Sonic collector			Treatment and elimination of commercial smokes, dusts, mists with sound. Recovery of fines	Collection of fly-ash, salt cake where particle size is small, especially below 10 microns Probably not economical for gas flow less than 1500 cfm.	Ultrasonic Corp.
Wire cloth screen	50-50,000 cfm. air	Steel, stainless steel, aluminum, nickel	Periodic reversal of air stream to facilitate removal of dust from cloth	For materials not easily shaken from cloth	W. W. Sly Mfg. Co.

HEAT EXCHANGE—New Equipment Announced 1947-8

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations	Company
Condensate return system			5 hp. unit will hande 15 gpm. at 150 psi. pressure differential	Returning condensate from steam-heated process equipment to high pressure boilers	Cochane Corp.

HEAT EXCHANGE—New Equipment Announced 1947-8 (Continued)

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Condensate return system	Range from 10 hp. boilers up		Eliminates individual traps on steam lines, all boiler feed deaerated	Condensate return to boilers	Up to 350°F.	W. M. Acker Org.
Condenser	6-20" shell diameter	Inconel, stainless steel, nickel, aluminum, Hastelloy	Line for condensing, vaporizing and cooling involving standard designs	Still condensers, reboilers, heaters, coolers	Limited pass arrangement, standard nozzle sizes	Struthers-Wells Corp.
Cooling tower		Wood, steel	Cylindrical tower designed to eliminate dead air spaces, air enters from any point on circumference			Santa Fe Tank & Tower Co.
Cooling unit	3,000,000-15,000,000 BTU. per hr.		2 water connections on each side makes for simplified piping, wind utilized in addition to fan	Cooling water, gas, oil, condensing vapors		Young Radiator Co.
Corrosion-proof heaters		Graphite	Full line of plate heaters, heat exchangers, bayonnet heaters and pipes and fittings			General Ceramics & Steatite Corp.
Dielectric heating generator			Special cubicle providing two sets of operating controls to permit operation on two different time cycles	Plastics industry		Westinghouse Corp.
Dowtherm heater	100,000 BTU. per hr.		Portable, self-contained heating and cooling unit, working pressure 60 psi.			Blaw-Knox Co.
Finned tubing	⅝-1" O.D.	Copper, steel, brass	No rifling inside tube, available in any wall thickness	Condensing gases	Cannot be used when condensed gases deposit solids	Doyle & Roth Mfg. Co.
Finned tubing	Range of sizes	Ferrous, nonferrous	Coiled tubing with serrated fins as high as ⅝" without crushing or distortion of the fins			Fintube Coil Corp.
Finned tube heat exchanger		Copper, brass, steel alloy tubes	Serrated fins soldered or welded to tube depending on requirements	Cooling and condensing		Joseph A. Coy Co., Inc.
Grid exchanger		Graphite	Non-clogging surfaces, corrosion resistance, thermal shock resistance	Corrosive processes including hydrochloric, hydrofluoric, phosphoric, sulphuric acid solutions or their salts	Not for strong oxidizing acids	Heil Process Equipment Corp.
Heater	52,600-552,000 BTU. per hr.		Free convection channels insure air cooling of motor	High ceiling heating		Young Radiator Co.
Heat transfer coils	½-2½" I.D.	Lead-covered copper	Will withstand pressues up to 150 psi., wall thickness required lower than that for pure lead, reduced price due to new process	Heating and cooling corrosive chemicals such as sulphuric acid		Knapp Mills, Inc.
Immersion heater	Up to 1,400,000 BTU. per hr. with blast		Spacer cages insure the entrainment of the required amounts of secondary combustion air		Usable with gases of 450 - 3200 BTU content	Bryant Heater Co.
Pressure jacket tank	150, 300, 500, 1000 gal.	Stainless steel	Removable horizontal agitator blade and shaft, neoprene scraper blades, rotary seal housing, compact	Heavy duty processing, steam and hot water heating, refrigertion	Slow speed only	Metal-Glass Products Co.
Reactor		Any weldable material	Direct or indirect heating by oil, gas, steam, electricity or Dowtherm, various types of agitators can be provided			Industrial Process Engineers
Sampling exchanger	8½"x6½" x13 and ⅛"	Cast iron shell, stainless steel or copper tubing	Compact, light, portable	Heating and cooling sample quantities of process fluids in checking specifications and determination of process efficiencies		Whitlock Mfg. Co.
Self-cleaning heat exchanger	Individual units to 1500 GPH.	Steel shell, steel or alloy tubes	Hydraulically operated	Heating liquids and solutions containing substances which tend to settle out and foul the tubes		Davis Engineering Co.
Vacuum furnace	175 in. treating capacity	Tungsten heating element	Continuous operation at 1800° C. with vacuum as high as 5 x 10^{-6} mm. Hg.	Heat treatment of materials which are highly reactive toward gases		Eitel-McCullough, Inc.

ADSORBERS—New Equipment Announced 1947-8

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations	Company
De-ionizer	"Package unit"		Higher purity of effluent effected by improved synthetic resins, lower cost per gallon and simpler regeneration due to upflow operation		Barnstead Still & Sterilizer Co.
Ion-exchanger	As specified	Steel	Automatic operation on acid cycle with upflow regeneration and pH control	Boiler feed and special processes	Worthington Pump & Machinery Corp.
Water softener			Multiport valve controlling all operations. Compact unit due to new type of synthetic resin. Combination of salt storage and brine solution compartments in single container.	Produces water of 0-2 ppm. hardness expressed as $CaCO_3$	Liquid Conditioning Corp.

SAFETY—New Equipment Announced 1947-8

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Air-foam system	Wide variety		Simple, compact installation of large foam-producing capacity.	Vehicles with booster pumps, water tank; or stationary installations with auxiliary pump, water hydrant	Must not be subjected to freezing	Pyrene Mfg. Co.
CO tester			Sample of air is aspirated by squeezing bulb. Yellow indicating chemical turns green in direct proportion to CO concentration, enabling comparison with standard color scale		Will indicate CO concentrations from .001 - .10% by volume in air	Mine Safety Appliances Co.

SAFETY —New Equipment Announced 1947-8 (Continued)

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Combustion safeguard		Baked enamel housing	Relay prevents operation if unsafe conditions exist during starting period, photo-cell responsive only to "blue spectral" rays	Protecting gas and oil fired equipment	Not for powdered coal	Wheelco Instruments Co.
Dry chemical extinguisher	19⅛" long, 3½" dia.		Non-toxic, non-corrosive, non-abrasive, electrically non-conducting extinguishing agent			Ansul Chemical Co.
Explosion-proof lighting fixture	75-200 watts		Underwriters' Laboratories rating Class 1, Group A.; 19 psi. pressure	Chemical, paint and petroleum industries		Safe Lighting, Inc.
Eye washing fountain	⅛" water inlet	Enamel bowl	Placing the face over bowl causes two streams to flow into eyes			Benson & Associates, Inc.
Eye washing fountain		Aluminum	Two streams of water simultaneously directed against eyes. Actuating valve operated by resting head on bowl			Precision Scientific Co.
Face Shield		Plastic	Light, durable, easy to attach to respirators	Protects eyes and major part of face against impact of foreign particles		American Optical Co.
Fire fighting wetting agent			When added to water reduces the surface tension giving greater spreading and penetrating powers. Concentration <1% are required			American-LaFrance-Foamite Corp., Inc.
Fire hose			Light weight, easily coiled, high burst resistance, corrosion resistant			Hewitt-Robins, Inc.
Flexible hose attachment	For safety cans ½ gal. or larger		Flexible enough to be turned to any position, but rigid enough to remain in a set position	For pouring flammable liquids		Justrite Mfg. Co.
High pressure automatic tank gauge	For tanks to a ht. of 60'	To suit liquids in storage	Testing device to insure free movement of tape, hi-low level alarm, simple adjustment to compensate for gravity changes of liquid in storage	Rapid, accurate measuring of liquids in storage	Pressures to 250 psi	Vapor Recovery Systems Co.
Liquid level alarm		Monel float	Electric switch operated by permanent magnet when float rises or falls in float chamber	Can be wired for normally open or normally closed circuit for tanks and small boilers	Pressures up to 250 psi.	Reliance Gauge Column Co.
Methane alarm			Alarm can be preset at concentrations of 0.25-3.00%, battery powered	Transmission line repair, tank cleaning		Mine Safety Appliances Co.
Millivoltmeter excess temperature cut-off			Fuel or power supply instantly cut off when temperature exceeds preset value at which time remake cannot take place till temperature drops below high limit setting	For protection of process equipment		Brown Instrument Co.
NO_2 detector			Field kit, colorimetric comparison determination			Mine Safety Appliances Co.
Non-skid mat	16" x 23½"	Rubber	Available in color combinations to subdue footprints, and in Neoprene oil-and-grease resistant rubber	Acts to protect legs and feet from standing fatigue		Colonial Rubber Co.
Respirator	5 in.² filter area	Chemically treated felt filter	Equivalent in dust filtering efficiency to 42 in.² untreated filter. Equipped with gauze prefilter	Protection against lead, cadmium, arsenic, chromium, silica, coal, limestone dusts		American Optical Co.
Noise reducer			Can reduce noise level by 90%. Outer flange prevents unit from entering ear too far.			Mine Safety Appliances Co.
Perspiration retainer		Sponge rubber	Constantly absorbs perspiration, creating a cooling effect	To provide greater comfort on hot jobs		Mine Safety Appliances Co.
Proportioning mixer	For lines up to and including 1 and ½"		Proportioning at-the-pump allows complete freedom of movement. Introduces liquid foam or wetting agents into fire streams without dissembling the equipment	Can be installed on present fire-fighting equipment where pressure is maintained by a pump	Gives fixed mixtures at 30-125 psi. with fog or straight steam	Alladin Proportioners, Inc.
Protective bottle carrier	For 1 lit. to 5 gal. bottles	Neoprene or duck	Carrier as safety measure against cuts and burns			Benson & Associates, Inc.
Safety goggle		Plastic	Unobstructed side vision, excellent frontal protection	For wear directly over eyes or over spectacles		American Optical Co.
Sofety goggles		Plastic	Shatterproof lenses	Fit over even widest safety spectacles		Watchemoket Optical Co.
Self-contained air foam system	200 gal. water tank, 10 gal. foam tank		Produces 3500 gal. of air foam by automatic proportioning	Where completely independent water or foam discharge is needed	Must not be subjected to freezing	Pyrene Mfg. Co.
Self-contained breathing equipment	19½ lbs.		Instantly ready for use	Provides a minimum of 15 min. use		Scott Aviation Corp.
Standing mat	20" x 18"	Sponge rubber		To reduce or relieve fatigue of workers who stand for long hours		B. F. Goodrich Co.
Wheeled foam extinguisher	40 gal. capacity	Galvanized steel tank	Produces 375-400 gal. of long lasting foam	Fire hazards involving flammable liquids and ordinary combustibles	No below 40° F.	Pyrene Mfg. Co.
Wire rope covering	Lengths up to 50'	Neoprene	Gives protection against weathering, abrasion and corrosive liquids, guards workers from needle-like wires protruding from cable			Wind Turbine Co.

CENTRIFUGES—New Equipment Announced 1947-8

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Centrifuge	½ ft.³ basket capacity	Iron and steel, rubber-coated steel, alloys	Totally enclosed, vapor-tight construction. Wide range of retention time. Continuous, completely automatic	Pilot plant or low production installation		Baker-Perkins, Inc.
Centrifuge	3-10 gal.	Stainless steel rotor, corrosion resistant housing	Compact, continuous unit	Pilot plant	Products must be discharged in a fluid state	Merco Centrifugal Co.
Safety cover for centrifuge	Adaptable to any size		Machine cannot be started till cover is closed. Prevents access to basket while in motion. Feed pipe permits feeding at low speed		Adapted to motor driven equipment only	Fletcher Works, Inc.
Suspended type centrifuges	20" and 26"	Stainless steel, monel	Hydraulic drive, infinite speed control	Pilot plant	Speed to 2500 rpm.	American Machine & Metals, Inc.

DISTILLATION AND EXTRACTION—New Equipment Announced 1947-8

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*	*Company*
Decarbonater	Capacities to 1800 gph.	Plastic coated welded-steel	Blower draws air up through the packed tower countercurrent to the water. Air inlet filter prevents dust contamination		Cochrane Corp.
Hot process water softener	As specified	Steel	Heating and deaeration without tubular vent condenser other sizes proportionately less	Boiler feed	Worthington Pump & Machinery Corp.
Hydrogen sulphide remover	5' x 5'8" x 18'		Self-contained, portable, direct-fired, air-cooled automatic unit employing ethanolamines	Purification of drilling rigs or compressor station fuel gases	Graff Engr. & Equipment Co.
Liquid fractionator	Various sizes	Monel, stainless steel, aluminum, copper	Multi-stage countercurrent contacting of the two liquid phases	Separation involving close-boiling, azeotropic, non-volatile, heat-sensitive mixtures Not for solids	Otto H. York Co., Inc.
Wire mesh entrainment separators	Various sizes	Monel, stainless steel, aluminum, copper	Light weight, complete with supporting grating	Distillation towers, gas absorbers, evaporators	Otto H. York Co., Inc.

PUMPS, COMPRESSORS, AND EXPANDERS—New Equipment Announced 1947-8

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*	*Company*
Air compressors		Welded steel frames	Produce 100% oil-free air, portable	For fractional horsepower air compression	American Brake Shoe Co.
Blower	8-16 oz.		Adjustable outlet complete 360°, uses any standard 3600 rpm. motor	Exhausting fumes, distributing gases, supply fuel oil under pressure	Lindberg Engr. Co.
Blower	2-6" outlet		Supply 100-525 cfm. at pressure classification of 4-18 oz. Light weight, motor power 1/32-hp.		Bryant Heater Co.
Centrifugal pump		Any workable alloy	Parts in contact with fluid pumped easily removable. Large changes in capacity and head can be obtained by a change of impeller diameter or of casing and impeller size	Handling of slurries without clogging	Mission Mfg. Co.
Centrifugal pump	3" inlet, 2" outlet	Cast iron with glass lining	Gas seal barrier between liquid and stuffing box or rotary seal combined with automatically maintained lubrication of packing	Of particular use where chemical resistance is required beyond the range of alloys	Pfaudler Co.
Chemical feeder			Same motor slowly lowers decanting pipe during feeding and raises it rapidly when tank is empty. Positive non-slip feeding by means of chain and sproket drive, changes in feeding rate by an adjustable micrometer dial	To feed chemicals in solution or suspension to water that is to be treated. Equally adapted to constant rate or proportioning rate control systems	Liquid Conditioning Corp.
Close-coupled centrifugal pump	17 sizes		Pump and motor combined on single shaft, machined stuffing box permits use of mechanical seal or semi-metallic packing with lantern-type liquid seal rings	Capacities up to 200 gpm. and heads up to 400'	Goulds Pump, Inc.
Compressor	9 sizes		Power requirements 15-100 hp., piston displacement 81-590 cfm. at discharge pressure of 100 psi.	Standard electrical drives include built - in - motor, direct - connected motor and V-belt. Gasoline or Diesel engines may be used	Joy Mfg. Co.
Fan	18-72"	Steel or aluminum alloy bladed wheel	Axial fan in straight-through or convertible elbow types. High mechanical and static efficiency combined with large volumetric capacity	Air conditioning, dust and fume removal, mechanical draft for combustion ,industrial drying. Convertible elbow type ideal for high temperatures	Westinghouse Electric Corp.
Fan	124 models, 18-60" housing diameter		Axial flow with adjustable blades	For pressures up to 9.60" water gauge, and up to 100,000 cfm.	Joy Mfg. Co.
Fan	16-36" propeller diameter	Non-ferrous metal blades	Fan shaft and motor ball bearing mounted for smooth, long life, and economical operation, either vertical or horizontal.	Heavy duty booster fan	Chelsea Fan & Blower Co.
Gear pump	6" suction, 2" discharge	Any machinable material	Hopper-type intake	Transfer of heavy viscous materials against light discharge pressures	H. K. Porter Co.
Gearless pump	¼", ½"	Monel, bronze, stainless steel	Double impeller design gives strong flow against pressure	Capacities 1-12 gpm. against heads up to 50 psi. at 200-3500 rpm.	Eco Engr. Co.
Hydraulic foot pump			Weight 15¼ lbs.	Pressures up to 1500 psi. can be obtained	Lyon-Raymond Corp.
Metering pump			Will pump at constant controlled flow without pulsation, capacity adjustable while pump operates	Constant controlled flow at very low capacities down to 75 ml. per hr.	Milton Roy Pumps Co.
Pump governor		Stainless steel main valve	Eliminates stuffing box and rubber diaphragms	Improves pump performance and reduces governor maintenance	Leslie Co.
Pump lubricant			Anti-acid lubricant can be injected into the lantern ring using a grease cup. Provides protection against direct acid or mild caustic attack		James K. Harbinson & Co.
Reciprocating pump	3-6" dia. plunger, 4-12 cylinders		Handles liquides at volumes up to 64,000 bbl. per day and pressures up to 200 psi. Can be directly connected to prime mover. Volumetric eff. 95% at 400 rpm. with 1500 psi. discharge pressure. Mechanical eff. over 92%	Oil pipe lines, high pressure boiler feeding	Cooper-Bessemer Corp.
Rotary positive displacement pump			Liquid being pumped ,in conjunction with the controlled clearance between the circumference of the impeller vanes, the side wall of the pumping chamber and the rotor, provides capillary sealing between the high and low pressure areas in the working chamber. Volumetric efficiency 90-95%		Rockwell Mfg. Co.
Self-priming centrifugal pump	⅜-1½"	Monel, stainless steel, iron, bronze,	Ball bearing—rotary seal, flexible impeller, wide range of operating speeds	Corrosive slurries and liquids, food processing Speeds to 1750 rpm., pressures to 40 psi., temperatures to 150°F.	Jabsco Pump Co.

PUMPS, COMPRESSORS AND EXPANDERS—New Equipment Announced 1947-8 (Continued)

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Side suction centrifugal pump	¼"-4"	Iron, bronze, fitted neoprene impeller bronze, stainless steel, Hastelloy	Uniform frame dimensions for all sizes of volutes permit quick another without change of shaft or power frame	Thin liquids	Not self-priming	H. K. Porter Co.
Slurry pump	2-6"	Flint metal, Flint-alloy, carbon steel, stainless steel ,semi-steel, manganese steel	Low pressure stuffing box, access to pump without disturbing suction and discharge piping	Pumping slurries containing abrasive solids		Morris Machine Works
Solids-handling pump	175-7000 gpm.		Special back cover allows for 2 rings of packing between the seal cage and the area of the casing in back of the impeller	Applicable where dilution must be kept at a minimum	Heads up to 100'	Allis-Chalmers Mfg. Co.
Steam-jet ejector	5 stages	Any suitable material	No moving parts, cold traps not required	For handling large volumes of gases below 100 microns pressure	Capacities to 13 lb. per hr.	Worthington Pump & Machinery Corp.
Stuffingboxless pump	Range of sizes		Pump and motor totally enclosed, will not flood out regardless of liquid level, submersible	For pumping volatile hydrocarbons		Byron Jackson Co.
Submersible pump	7½-350 hp.		Will not flood out		Capacities 100-7000 gpm	Byron Jackson Co.
Turbo-expander		Bronze, stainless steel	Light, compact, high speed, high efficiency	Production of refrigeration in low temperature processes		Elliott Co.
Vacuum pump	2½"	Stoneware	Completely corrosion resistant liquid piston type pump	Handling of wet chlorine and related products	Not for hydrofluoric acid	General Ceramics & Steatite Corp.
Ventilator	425 cfm.	Aluminum	Electric motor driven ,weight 50 lbs.	Blower or exhauster for eliminating hazardous gases ,fumes, etc. from inaccessible places		United Electric Motor Co.
Vane pump	1/6, ¼, 1/3 hp.	Stainless steel, bronze and carbon	Positive pressure pump for capacities up to 5 gpm. and pressures to 60 psi., larger models for continuous duty	Pumping non-lubricating corrosive liquid	Liquid must be free of abrasive materials	Eastern Industries, Inc.
Wet pit type pump			Overhead bearings ,can be belt-driven or motor-driven	Heavy liquids, hot liquids, liquids containing solids	Up to 1000°F.	Nagle Pumps

EVAPORATORS—New Equipment Announced 1947-8

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Vapor compression evaporator	50-5000 gph.	Stainless steel, copper, brass, cupro-nickel	1000 gals. per hour of evaporation for total power input of 100 kwh., all electric automatic operation	Production of high quality distilled water, concentration of aqueous solutions. Used in place of single and multiple effect steam evaporators	Must be a minimum of fouling, and small boiling point rise of the liquid during concentration	E. B. Badger & Sons Co.

SOLID SEPARATION—New Equipment Announced 1947-8

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Auto-sluice filter	200-500 ft.²	Stainless steels, cuprous and other alloys	Automatic cleaning without removing cover, 2-3 ft. of water required per ft. of cake	Breweries, sugar refineries, chemical plants	Not for uninhibited HCl or H_2SO_4 or non-aqueous solutions, dry discharge, slurries with over 8% solids	Niagara Filter Corp.
Ceramic slip lawn (Vibrating screen)	36"x48"	Stainless steel	Strong and durable construction, efficient	Lawning ceramic slip of any specific gravity		Hewitt-Robins, Inc.
Cold process water softener	As specified	Steel	Slurry bed maintained by hydraulic agitation, equipped with filter wash water reclamation compartment	General supplies		Worthington Pump & Machine Corp.
Continuous rotary vacuum filter	Built to specification, also 1 ft.² lab. size	Any metal or machinable alloy	Separates both slow and free filtering solids from liquids, discharges a thin cake yielding higher capacity, better washing and dewatering	Used for mycelia from penicillin, Kaolin, fatty acids, rubber accelerators, dyes		Bird Machine Co.
Enclosed tank pressure filter	16½" and 24" dia. plates	Any metal	Filters from center leaving only clear filtrate in tank which is never under pressure, hydraulic closing device	Clarification		T. Shriver & Co., Inc.
Filter cloth	26"-72" widths, various weaves	Nylon	High abrasion resistance, excellent heat resistance, unaffected by fungi. Inert to most alkalies, most organic acids, aldehydes, ketones, alcohols, carbon bisulphide, halogenated hydrocarbons, benzene		M.P. 482° F.	Filter Media Corp.
Filter sheets	Any required area	Porous stainless steel	Welded assembled sheets can be sheared, drilled, and machined. Welds are strong and ductile.	Porous material can be welded to solid stainless steel	Can be drawn and rolled within limitations	Micro Metallic Corp.
Hydraulic closer	24", 30", 36"	Cast iron	Replaces manual closing	For press 24" or larger, primarily for Shriver presses but can be adapted to most makes		T. Shriver & Co., Inc.
Laboratory filter	1000 and 350 cc.	316 stainless steel	Completely sanitary. Operates with laboratory air for 1000 cc. size and handbulb for 350 cc. size	Small sample runs		Sparkler Mfg. Co.
Magnetic ducts	4" to 3"	Galvanized iron, stainless steel, monel case	Self-contained unit, magnetic baffles	Removal of iron particles from air or gravity conveyed products in process		Columbia Engineering Service Co.

SOLID SEPARATION—New Equipment Announced 1947-8 (Continued)

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Distinguishing Features		Company
Magnetic pulley	Alnico	Non-electric	To remove tramp iron from belt conveyor system			Eriez Mfg. Co.
Magnetic pulley	12-24″ diameter, 12-60″ width	Steel	Automatic removal of tramp iron from belt conveyed products in process	Burdens to 3″ depth		Columbia Engineering Service Co.
Magnetic pulley	Standard diameters above 10″, widths in multiples of 6″	Cast aluminum and steel	Amply ventilated to dissipate heat caused by friction and belt slippage	As head pulley in belt conveyor systems where ferrous particles are to be removed		Homer Mfg. Co.
Magnetic pulley separator	8-48″ diameter	Alnico	Non-electric construction, applicable to wet or dry materials	Separation of magnetic and non-magnetic materials, protection of machinery and purification of product by removal of tramp iron		Dings Magnetic Separator Co.
Magnetic separator	Any number of cross belts		Separates magnetic products having different magnetic susceptibilities by means of high intensity, high selectivity magnetic pole, hand wheel adjustment of air gap and variable speed drive on main conveyor belt. Each cross belt magnet may be varied in strength	Can separate one non-magnetic and any number of magnetic materials		Dings Magnetic Separator Co.
Magnetic trap	2-4″	Stainless steel, bronze	Heavy duty magnetic plates	Pottery glaze or other liquids requiring removal of metal particles.	Pressures up to 15 psi.	Columbia Engineering Service Co.
Pressure filter	Line of sizes	Stainless steel, glass	Compact, elements easily replaceable, high flow rates possible	Corrosive fluids, pharmaceuticals	Not for slurries with high solids concentration	Selas Corp. of America
Pressure leaf filter	10-600 ft.²	Steel tank with homogeneous lead lining	Permits use of glass cloth, asbestos and synthetic resin cloths	For filtration of sulphuric acid solutions		Hercules Filter Corp.
Rotary leaf pressure filter	100-1290 ft.² filter area		Compact, rotation of leaf retards settling and builds a better cake. Cake sluiced or discharged dry without opening up filter casing	Handling of corrosive or volatile liquids, liquids containing slow settling solids	Batch operation	General American Transportation Corp.
Rotary pressure leaf filter	200-800 ft.²	Steel and stainless steel	Internal self-cleaning	Aqueous solutions, particularly in large volumes where long cycles are required		Hercules Filter Corp.
Rotary vacuum filter	3′ drum diameter, 1′ drum width	316 stainless steel	String discharge	Pilot plant work		Filtration Engineers, Inc.
Sifter			High efficiency index, furnished for high speed or low speed. Easy cleaning and removal of parts. Smooth starting and stopping			Great Western Mfg. Co.
Slurry filter	24-48″ dia.	Stainless steel, steel, bronze	Uses diatomaceous earth, sturdy screen riveted construction avoiding all solder	Chemical industries, breweries, distilleries, beverage plants		Enzinger Union Corp.
Test press	98 in.² filtering area		Easily set up, can use own pump, only one filter cloth required	Testing different materials at various pressures		Chemequip Co.
Vibrating screen	3′x8′ to 6′x14′		Two-bearing vibrator mechanism imparts concentric motion to all points of screening surfaces. Double or triple decks; single-deck screens can be provided by removal of lower deck of standard double-deck screen	For medium and heavy duty sizing, scalping and dewatering		Link-Belt Co.
Waste treating equipment			Reduces quantity of suspended material by recycling previously precipitated solids	For wastes with voluminous and slow settling solids		Infilco, Inc.
Wax molding press	As required	Aluminum, cast iron	Wax cakes produced without shrinkage			T. Shriver & Co., Inc.
Wire cloth		Monel, brass	Equal to 200-mesh in filtering and straining action, yet 7 times as strong, and always lays flat			Michigan Wire Cloth Co.

INSTRUMENTATION AND PROCESS CONTROL—New Equipment Announced 1947-8

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Air-fuel ration controller			Full metering control of fuel and air in any desired proportion, can be adjusted to vary ratio automatically at low fuel flow, supplied for gas or oil	Large fuel-fired furnaces, soaking pits, kilns, oven		Leeds & Northrup Co.
Air velocity meter	4″ x 3″ x 1½″		Completely self-contained, requires no jet attachments.			Illinois Testing Laboratories
Air velocity meter			Will measure velocities as low as 5 rpm., standard range up to 2000 fpm. can be increased to 6000 fpm with no loss of accuracy at low velocity			Hastings Instrument Co.
Aneroid manometer	9″ body	Stainless Steel	No sealing fluids or blow back systems needed, range changes easily made	For corrosive media	300 psi. working pressure	Taylor Instrument Cos.
Appliance temperature tester	15½″ x 10 and ⅜″ x 4¾″		Reads 4 cold zones —100°F. to 80°F., 2 heat zones, 0-600°F., 1 voltage range, 2 amperage ranges	Temperature adjustment for heating and cooling equipment		J-B-T Instruments, Inc.
Automatic defrost system	Various		Automatic, efficient, variable operation	Low temperature freezers		Tenney Engineering, Inc.
Auto-selector	12″ chart		Controls selectively from either of two related variables by positioning a single operator, permits the use of automatic reset function	Pump control where discharge must be held at or below a maximum value and suction pressure at or above a minimum value		Foxboro Co.
Ball flow indicator	For ¼-2″ pipes	Brass ball	Can be used with lubricating oils and many solvents	For visual indication of flow and approximate rate of flow	For .2-60 gpm.	Schutte & Koerting Co.
Bulb-type temperature controller			Liquid filled bulb and bellows assembly applied to snap-acting switch	Standard ranges 50-600°F		United Electric Controls Co
Chemical service rotameter	¼-4″		Rigid, self-supporting in pipeline, eliminates need for stuffing boxes	Glass flange may be connected to standard four hole flange		Schutte & Koerting Co.

INSTRUMENTATION AND PROCESS CONTROL—New Equipment Announced 1947-8 (Continued)

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*		*Company*
Combustible gas detector			One range analyzes combustible gases in terms of lower explosive limit, another in their toxic range			Davis Emergency Equipment Co.
Continuous viscosity recorder				For high viscosity fluids in flow	Up to 800,000, cps.	Fischer & Porter Co.
Control Station	Panel 4⅛" x 4¾"		Remote setting regulator, one gauge that indicates control point, process and valve pressures.	Graphic panels and compact central control panels		Moore Products Co.
Corrosion resistant pressure gauge	Several sizes and styles	Beryllium-copper bourdon tube		For acetic acid, ethanol, sodium acid sulphate, oxalic acid, sulphite solution, milk of lime, hydrogen sulphide		Jas. P. Marsch Corp.
Corrosion tester			Yields quantitative information on extent to which metals polarize in given media	Evaluating inhibitors, choosing proper alloys and determining corrosiveness of chemicals		Glenn A. Marsh
Derivative unit	¼" IPS. connections		Separate unit to provide either direct or inverse rate action. Diaphragm construction without levers or linkages. Friction-free	Difficult flow and pressure control systems		Moore Products Co.
Dew-point recorder and controller	12" chart		"Dewcel" element, requires no mirrors, water supply, air, current or refrigeration	Accurate, continuous direct measurement or control of dew-point		Foxboro Co.
Dial Thermometer	Stem lengths 4", 6", 9", 12"	Stainless steel stems	Adjustment of dial and pointer within full 360° may be made while in service	11 standard scales from —100 to 850° F.	Accuracy 1% of range	Precision Thermometer & Instrument Co.
Dial type thermometer	Various models 0-1000° F.	Various metals	Flat stem provides more accurate readings by clamping to flat surfaces			W. C. Dillon Co.
Differential pressure transmitter		Stainles steel parts in contact with fluid	Employs force-balance principle, employs no mercury, converts measured differential pressure into proportional air pressure	Measurement of flow or liquid level especially where mercury cannot be used		Foxboro Co.
Dynamic micrometer			Provides direct reading of static or dynamic displacements, vibration or movement of any metal body, measurements independent of acceleration or frequency of displacement	For measuring movements of crank or shafting	Accuracy to .0002"	Electro Products Laboratories
Electric contact controller			Minimum contact pressure, 24 volt circuit	Temperature, pressure, flow, liquid level, humidity	On-off applications where process lags are small	Taylor Instrument Cos.
Electronic area meter	1", 2"	Cast iron, cast steel	Substantially constant pressure drop, records total, difference or ration of two or more flows	Accurate measuring of viscous liquids	Small size	Bailey Meter Co.
Electronic feed control	Any size motor		Improved regulation enables better setting to give closer operation and regulation of feed	Process equipment where load is reflected in motor driving the equipment	Not suitable for for ball mills or rod mills	Mosher Electronic Controls
Electronic pyrometer controller			6" mirrored-scale, ruby "eye" indicates on and off.	Heat control of furnaces, melting pots and kilns		Illinois Testing Laboratories, Inc.
Electronic servo system	Up to 3750 lb. in. torque capacity (combined with hydraulic power unit)		High accuracy of laboratory instrument, constructed for heavy industrial use	Automatic electronic remote control of valves, dampers and other mechanical mechanisms	Not explosion-proof	Askania Regulator Co.
Electronic temperature controller	1 position		No moving parts in heat zone, no thermal compensation required, resistance thermometer bulbs for remote temperature detection		Non-recording, non-indicating	Thomas A. Edison, Inc.
Flame protector			Available with purge timing arrangement which permits purging of furnace of explosive mixtures before reignition, and photoelectric head for use on oil burners			Brown Instrument Co.
Flame spectrophotometer			Can detect at least 40 elements in concentrations as low as .01 ppm. of a metal in solution, requires only 5ml. sample with accuracy of better than .1%.	Analytical and control work	Solution must have viscosity not more than 3-4 times that of water	National Technical Laboratories
Flammable vapor detector			Automatic continuous sampling. At explosive limit of vapor relay is actuated. Current failure also actuates relay		100-120 volt 60 cycle AC, special units for other power supplies	Jabez Burns & Sons, Inc.
Flexible pivot			Can be mounted in any position without loss of calibration	Avoid friction in the transmission of impulse signals		Askania Regulator Co.
Float switch		Brass float	Adjustable differential from 2-6" water level, 4 operating arrangements	Closed tank operation	Pressure to 100 psi., temperature to 200°F.	Automatic Control Co.
Flowmeter			Precision laboratory features in applications	a design suitable for industrial		Commercial Research Laboratories, Inc.
Flow rate indicator			Rotational speed of turbine measures quantity of liquid flowing	Calorimetry, pump capacity measurements, fuel consumption control data		K & K Engineering Co.
Galvanometer			High sensitivity with lamp-and-scale design, easy to adjust zero, dual sensitivity for initial stage of measurements	Labortary and industrial test work		Leeds & Northrup Co.
Gas analyzer	1½" x 3½" x 2⅜"		Relatively unaffected by vibration or ambient or current change	Provides measure by means of thermal conductivity of an unknown gas or variation in a known gas		Gow-Mac Instrument Co.
High pressure gauge	Any length	As required	Exposed pressure areas have been minimized to reduce the possibility of glass or gasket failure	High pressure work 10,000 psi. or higher where it is not feasible to use liquid level gauges	Up to 300°F.	Jerguson Gage & Valve Co.
High pressure liquid level gage	Lengths up to 6'	Steel, special alloys			Up to 10,000 psi.	Jerguson Gage & Valve Co.
Humidity instrument			Eliminates need for external coolants, dew or fog observed while suspended in air, not on a polished surface		2 ranges, dew-point —20°F. to room temperature, and —100-0° F.	Illinois Testing Laboratories, Inc.
Humidity sensing element			Responds in less than 1 sec. to increase or decrease in rel. humidity, detects changes as small as .1% rel. humidity, accuracy unaffcted by barometric pressure	Remote installments, may be used to indicate, control, record	7-100% rel. humidity	American Instrument Co.

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*	*Company*
Integral control by-pass			4-positioning switching action, switch from automatic to manual control does not affect air pressure	Providing automatic, manual, test and service switches on pneumatic control system	Brown Instrument Co.
Limited sensitivity controller		Stainless steel	Fewer mechanical parts, finer sensitivity settings, positive action, completely interchangeable unit	Temperature, pressure, flow, liquid level and humidity where small lags and high capacities make high range sensitivity control adequate and satisfactory	Taylor Instrument Cos.
Low temperature radiamatic			Utilizes energy in infra-red part of spectrum to measure temperature without physical contact	Object must have constant emissivity over entire range of temperature measurement, sighting area must be shielded.	Brown Insrument Co.
Mercury manometer		Steel	Greater energy output, inherent straight line calibration, interchangeable range chambers	Flow, liquid level, and differential pressure — 1500 psi. rating, ranges from 10"-533" water	Taylor Instrument Cos.
Organic liquid thermal system		Stainless steel	Small bulb, short range intervals, sub-zero ranges, case temperature compensated	Where manufacturing process is sensitive to mercury, for low temperatures — —40 to 280° F., capillary uncompensated for ambient temp. changes.	Taylor Instrument Cos.
Oxygen recorder		Corrosion-proof	Uses thermal conductivity method, operates by accurate hydrogen-difference method.	Analysis of flue gas as index to excess air	Leeds & Northrup Co
pH meter	7" x 8½" x 11¼"		Complete shielding of glass electrode eliminates electrostatic interference, used in tanks without being effected by grounded solutions ,automatic temperature compensation 0-100°C Industrial measurement	Industrial measurement — 110 volt AC, accuracy of .1pH from 0-14 pH	Cambridge Insrument Co.
pH meter			2 stages of voltage regulation to allow for variations of 80-135 volts, circuit completely freed from grounding	Industrial controlling and recording	Macbeth Corp.
pH recorder			2 pH records may be made simultaneously or one pH record may be combined with one of flow, temperature or conductivity	Recording pH of solutions in continuous processes	Bailey Meter Co.
Photoelectric detector			Gauging, measur ng and controlling applications in one unit without use of any sensitivity adjustment. Provision for color or infra-red operation	Can act as switch or measure light intensity	John T. O'Connor & Co.
Photoelectric turbidity recorder				To measure undissolved substances in boiler feed water, oils, solvents — Ranges of 0-3 ppm., 0-50 ppm., 100 ppm. up	Ess Instrument Co.
Platinum resistance thermometer		Helium-filled, glass-sealed	Extremely small size, four-wire leads	Low-temperature calorimetry in vicinity of 10° K.	Leeds & Northrup Co.
Pneumatic integrating meter	12" chart			Gas measurements and where electricity is not available or permissible, for wide range applications or pulsating flow	Foxboro Co.
Pneumatic set ratio controller	12" chart		Permits adjustment of ratio setting from a remote point or from a third variable. Adjustable safety limit stops and manual cut-out	Continuous blending of two material streams in a ratio to obtain a constant characteristic of the final product	Foxboro Co.
Pneumatic transmitter	12" case		Incorporates perfectly matched transmitter and receiver elements	Pneumatic transmission of measurements of process variables	Foxboro Co.
Portable radiation meter			3 operating ranges, 20, 2 and .2 mr./hr., eliminates zero control, 400 hrs.	Measurement of radioactivity of low intensity such as locating l intensity such as locating leaks or lost radioactive material	National Technical Laboratories
Portable Radiation meter	4" x 6" x 11"		3 operatnig ranges, 20, 2, .2 mr./hr.	Qualitative and semi-quantitative measurement of radiation ,for finding radon needles, and in geological surveys	Industrial Development Laboratories
Precision indicator			Incorporates double scale and two separate measuring systems with an external range change switch		Brown Instrument Co.
Pressure gauge element				Permits measurements from 100" water to 15 psi vacuum or pressure when installed	Brown Instrument Co.
Pressuregraph			Measures static or dynamic pressures and relates them to time, angular velocity, or any point in angular rotation	Automotive, diesel, oil, and chemical industries — Must be water-cooled above 130° F., vacuum to 10,000 psi.	Electro Products Laboratories
Pressure loaded gas regulator			Controls pressure within a fraction of an inch water even with large variations in flow	Reducing or back pressure service up to 100 psi. control pressure — Working pressures to 250 psi.	Hammel-Dahl Co.
Pressure snubber		Porous stainless steel filter disc	Eliminates pressure gauge fluctuations caused by pressure pulsation and vibration	Pressure line installation to protect instruments, to prevent mercury losses from manometers. — Standard to 500 psi., also supplied for use to 5000 psi.	Equipoise Controls, Inc.
Pressure transducer			Large voltage variations, or large outputs, for extremely small pressure changes.	Range ± 20" of water	G. M. Giannini & Co.
Pressure transmitter	3" x 6"		Combines controlled action bellows and potentiometers into one rugged unit. AC or DC signal	For gases and liquid — Accuracy 2%, pressure 0-500 psi., resistances 100-20,000 ohms	G. M. Giannini & Co.
Probe-type level control		Stainles steel probe rods	Contains no vacuum tubes, operates with low voltage in probe circuit	Control level of ductive liquids — electrically con-	Photoswitch, Inc.
Program recorder and controller	12" chart		Housed in one case, periods of rise and holding may be adjusted on one cam without removal from instrument	Controlling temperature or pressure in accordance with prearranged program.	Gotham Instrument Co., Inc
Programming control			With flame failure scanner protects oil-burning installation, control automatically starts burner and programs a sequence of fuel-valve opening, post-ignition time, priming and scavenging.	Oil-burning equipment	Combustion Control Corp.
Proportional controller			Utilizes strip chart recorder, provides valve position for every value of process variable	Any application requiring proportional control	Brown Instrument Co.

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*		*Company*
Pyrometric indicator			Conventional briquet cold junction compensator replaced by a new compensator which derives its energy from line supply			Taco West Corp.
Rate action unit			Enables controllers to give an extra response which produces greater control on processes subject to large lags or sudden disturbances	For location in the controller cases of pneumatic proportioning controllers		Brown Instrument Co.
Reference conductivity cell		Pyrex protected by stainless steel sheaths	Automatic temperature compensation provided, can be used with corrosive solutions	Continuous recording or automatic control systems with temperature variation of electrolyte	Pressure to 50 psi., temperature to 150°C.	Industrial Instruments, Inc.
Remote index setting device			Lowered time lag, tendency to drift eliminated, calibrating device permits adjustment of control index	Pneumatic transmission systems		Brown Instrument Co.
Repeat cycle timer			Independently variable on and off intervals ranging from 0.1 sec. to 40 min., wide variations in line voltage have small effect.	Life testing, process control		G. C Wilson & Co.
Roll surface temperature recorder and controller	12″ chart		Measures surface temperatures ± 2°F. without errors of friction, radiation, convection regardless of speed or roll material	Calenders and roll-type equipment		Foxboro Co.
Rotameter	¼-3″	Stainles steel		For corrosive applications	Up to 120 gpm. liquid, 240 cfm. gas	Brooks Rotameter Co.
Rotameter kit		Floats of pyrex, aluminum, stainless steel, monel	Flow ranges from 0.2 cc. per min. to 200 cc. per min. liquid flow, 10-700 cc. per minute gas flow. Larger rates with additional parts	Pilot plant		Brooks Rotameter Co.
Smoke density recorder			Accuracy unimpaired by age, high ambient temperatures, corrosive vapors or voltage variations	Flues, ducts, stacks		Bailey Meter Co.
Smoke indicator			Tamper-proof sensitivity adjustment on the photo-electric control	Continuous indication of the condition of gases passing through a flue		Photoswitch, Inc.
Solubridge controller			Automatic temperature compensation		Range 50-80% HNO_3	Industrial Instruments, Inc.
Steam jacketed flow meter			Entire meter steam jacketed to insure that material being metered remains liquid	Flow rate measurement of high melting materials	For 100 psig. steam	Fischer & Porter Co.
Stepless input controller and temperature indicator	8 models		Will maintain constant watt hour input and temperature despite voltage fluctuations, automatically compensating for room temperature changes	Pyrometer calibrated to 2000°F. for various heating devices	AC and DC models	Thermo Electric Mfg. Co.
Stepless temperature controller			Omission of pyrometer and thermocouple to reduce expense	With electric heating devices		Thermo Electric Mfg Co.
Strip chart recorder		Baked enamel housing	Recording function with positive power driven pen added to electronic link between measurement and control for deflection and null types		115 or 230 volts, 25, 50 or 60 cycles	Wheelco Instruments Co.
Supersonic flaw indicator			Maximum error in measurement less than 2% of thickness	Production line testing of thin pieces, bonded or clad materials		Sperry Products, Inc.
Supersonic weld tester			Smaller defects at greater depths can be located than with x-ray or other non-destructive testing equipment	Inspecting welds in ferrous and light metals for lack of bond		Sperry Products, Inc.
Temperature controller			Available with or without pyrometers, only a small portion of current allowed through heating elements	For use with gas and electric heating units	Ranges to 2000° F., and to order. 115 and 220 volt AC	K. H. Huppert Co.
Temperature monitor	25 position		Frequent automatic temperature checking with indication, alarm and safety cutoff at predetermined limits	Pumps, blowers, compressors	Non-recording	Thomas A. Edison, Inc.
Temperature recorder	5¾″ square, 4¼″ deep		Available in single-pen and two-pen forms, pen-arm unaffected by vibration, easily portable	Checking refrigerating, heating, air-conditioning equipment		C. J. Tagliabue Mfg. Co.
Temperature regulator	½-4″		Single-seated construction, packless main valve stem, liquid-filled thermostatic element		Positive control response to small temperature changes up to 450°F	Leslie Co.
Temperature transducer	1″ dia. 100-20,000 ohms, —65-150°C.		Slight temperature variations result in large voltage outputs, designed for telemetering applications where space is at a premium	Output suitable for recording with oscillographs, galvanometer - recorders, telemetering systems	Linearity 1%, accuracy 1%, sensitivity 1°C. or less.	G. M. Giannini & Co.
Test gauge			Accuracy within ½%	With Reid Vapor Test bombs		American Chain & Cable Co., Inc.
Thermal conductivity unit	1½″ x 3½″ x 2⅜″		Relatively unaffected by vibration, no special instruments required	Gas analysis		Gow-Mac Instrument Co.
Thermocouple		Silver tip		For highly accurate temperature readings on hot metal, rubber or plastic surfaces		K H. Huppert Co.
Thickness gauge			Housed in one case, as many as Measures within 3% of actual thickness	For non-destructive in service inspection and testing	Steel thicknesses 0.125 - 2.250″ can be measured	Scott Electroflux Co.
Time cycle controller	12″ case		8 cams	Controlling industrial process		Gotham Instrument Co., Inc.
Time cycle controller			Time measurement and pilot valve operation use separate mechanisms, for accurate timing of factors under control. High speed and pilot valve operation.	For timing mechanical operations in industrial processes		Bristol Co.
Time switch			Completely self-contained		110 volts AC, relay rated at 1 hp of motor load	Palo-Myers, Inc.
Time-temperature controller			Cycle can be set from a few minutes up to 3 hrs	Retort cooking of fods ,soap and other 50-300°F. processes		Brown Instrument Co.

INSTRUMENTATION AND PROCESS CONTROL—New Equipment Announced 1947-8 (Continued)

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Timing device			Range 5-60 sec.	To regulate input to electrically operated furnaces, AC ovens, heaters, baths; to control the proportionate flow of chemicals		Precision Scientific Co.
Vacuum gauge			May be corrected for changes in barometric pressure, graduated 0-30" mercury		Changes in atmospheric pressure affect accuracy	American Chain & Cable Co., Inc.
Vacuum pressure regulator	¼" IPS. connections		Pneumatic null balance operation provides accuracy and stability, barometric compensated models available	Precision control of sub-atmospheric pressures	0-20 psia. range on continuous flow of .02 scfm or more max. cap. 1 scfm of air	Moore Products Co.
Viscosimeter extension spindle	Any required length		Allows readier reading at point of process where previously impossible. Goes far enough beneath surface to be unaffected by surface turbulance or undulation			Brookfield Engineering Laboratories, Inc.
Voltage control unit	9" x 8" x 7"		4 plug-in load receptacles eliminate much wiring, output 0-135 volts	Accurate control of output voltages	115 volts, 50-60 cycles input, maximum current capacity 3.0 amps	Andrew Technical Service

GRINDING—New Equipment Announced 1947-8

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Fluid energy reduction mill	4" and 8" equivalent	Alloy steel	No moving parts, grinding done by gas or vapor high-velocity jets	Reduction of materials to low and sub-micron particles sizes, drying, mixing, etc.	2-2000 lb. per hr.	C. H. Wheeler Mfg. Co.
Gyratory Crusher	30"-72"		Primary crushing and grinding			Nordberg Mfg. Co.
Jaw Crusher	30" x 42"—72" x 96"		Primary crushing and grinding			Nordberg Mfg. Co.
Mill	6'-10'8" diameter, up to 50' length		Primary crushing and grinding			Nordberg Mfg. Co.
Plastics grinder	20-5000 lbs. per hr.	Carbon or stainless steel	Small units are portable	Small units for disposal of molded plastic scrap, large units for manufacture of virgin plastic		Mitts & Merrill
Traveling breaker plate crusher	42" x 50" and 36" x 24"	Manganese steel hammers and crushing surfaces	Adjustable clearance between hammers and crushing surfaces permits wide range of product size and wear compensation	Size reduction of materials such as wet, sticky clay, etc.		Jeffrey Mfg. Co.

MATERIALS HANDLING—New Equipment Announced 1947-8

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Adjustable conveyor belt troughing idler			Outer incline pulleys adjustable from slightly above the horizontal to 25°. Constant gap between the ends of the horizontal and inclined pulleys prevents belt damage due to creasing or pinching	For conveyors where any inclined belt changes to a horizontal path		Koppers Co., Inc.
All-weather cabs	For 4000 and 6000 lb. fork trucks		For driver protection in all types of weather or climate, can be equipped with heater, defrosters	Outdoor operations with temperature or climatic extremes		Clark Equipment Co.
Barrel stand	All standard size barrels		Barrels can be loaded by one man or raised off the ground high enough for draining purposes	Chemical, paint, petroleum barrels	Up to 1000 lbs.	Modern Equipment Co.
Barrel truck	For all standard size barrels		Barrels open at the head can be easily loaded and moved about in an upright position.			Modern Equipment Co.
Belt conveyor	6-60" widths, heights from 15" up	Aluminum alloy	5' sections can be quickly assembled into 150' unit		Speeds up to 100' per min., load capacity 250 lbs. per sq. ft. Max. temperature 500° F.	Patron Transmission Co.
Belt conveyor	6-31' lengths		Light-weight	Interfloor and horizontal movement of materials		Rapids-Standard Co., Inc.
Bridge ramp	Span gaps from 5-58" with differential heights up to 7"	Steel riding surface	Can be placed and secured by one person in less than 2 min.		Load capacity 15,000 lbs.	Elizabeth Iron Works
Bulk material conveyor with magnet		Alnico magnet	Adjustable chute removes stray iron			Material Movement Industries, Inc.
Center control fork truck	Overall length exclusive of forks 53 5/8"		A right angle turn can be made in 97½". Weight 3800 lbs. loaded	For use on floors having limited capacity, low capacity elevators, highway truck loading	For 1000 lb. load 30" long	Baker-Raulang Co.
Convertible conveyor	Straight sections 16" width, 5', 10' lengths. Curves 45° and 90°, 8' lengths	Steel	Convertible — high or low roller, rollers incorporate skate-type wheel with labyrinth ball race, retaining original lubricant, excluding dust or water	Handling materials or lugs, cartons, cases, cans, pails		Metzgar Co.
Conveyor	Belts 18" and 24"		Feed hoppers movable or fixed, one or two-way discharge hoppers	Handling bulk chemicals, in portable or permanent installations	Up to 250 tons per hr.	A. B. Farquhar Co.
Conveyor	12", 16", 24" belts		Gear and pinion or hydraulically controlled raising and lowering devices, power feeder units provide smooth flow	Conveying bags, boxes, cartons	Up to 500 lbs.	A. B. Farquhar Co.

MATERIALS HANDLING —New Equipment Announced 1947-8 (Continued)

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*		*Company*
Conveyor	6-20′ lengths, 8-24″ belt widths	Steel flight apron	Portable or stationary types	Handling finished or semi-finished goods from presses		Harry J. Ferguson Co.
Conveyor belt	4-ply and 5-ply	Glass fabric	Tensile strength equal to standard 32 oz. cotton fabric	Used for carrying hot lime from 300-450° F.		B. F. Goodrich Co.
Conveyor belt drive unit	Widths 10½″-26½″		Self-contained, for making custom built conveyor units from stock units	Applying tractive power to belts	Max. belt pull 400 lbs.	Standard Conveyor Co.
Conveyor flights	Conveying through 3″, 4″, 6″, 8″, 10″ pipe or semi-circular sections	Synthetic rubber	Circular cross section wipes pipe or trough clean. Mounted on sealed pin chains. Will follow pipe in any direction	Conveying into and out of pressure zones, handling abrasive materials		Hapman Conveyors, Inc.
Conveyor switch			3-way switch can be instantly adjusted by hand to provide flow left, right, and straight ahead			E. W. Bushman Co.
Cover and T-head bolt for spiral conveyor			Flanged, providing a smooth rounded edge and adding stiffness to permit use of fewer bolts. Slotted holes in cover permit it to pass over the T-head bolts without removing them			Jeffrey Mfg. Co.
Drum and barrel hand truck	Handle length 65″, width 25″		Rocker pick-up and wheels operate in same arc so that transition from loading to wheeling position is one smooth motion	Enables one man to transport heavy drums or barrels		Towsley Trucks, Inc.
Drum and barrel tilt	For std. 55 gal. drum or other sizes		Equipped with two safety locking devices to hold barrel securely. Barrel can be turned 360°			Palmer-Shile Co.
Drum clamp for fork truck			Self-adjusting for diameters 21½-24″, employs star cam permitting operator to release drum without dismounting	For safe handling of drums without spilling	Carries up to 700 lbs.	Clark Equipment Co.
Drum truck	30-55 gal. drums		Portable, smooth and safe revolving of a drum load up to 500 lbs. at 50 rpm.	Loading, unloading drums, mixing, tumbling, cleaning		Morse Mfg. Co.
Duplex bucket elevator			High capacities at either slow or high speeds. Even at slow speeds flanged pulley type head wheel and discharge arrangement prevent spillage when going over the head	For hot, light, fine, coarse, abrasive, fragile or sticky materials		Beaumont Birch Co.
Electric hoist	250-10,000 lb. cap.		Self-equalizing motor brakes keep loads in check regardless of current fluctuations	Lifting operations in processing, storing, shipping		Robbins & Myers, Inc.
Electric vibrating feeder power unit	Capable of vibrating decks 36″ x 72″ to 48″ x 72″		Dust-tight, provided with air inlet and outlet to permit air circulation through the motor. Loosening cap screws on support feeder changes slope from 5° upgrade to 15° downgrade	Handling magnetic, hot, dusty or abrasive material	Capacity 50-1000 tons per hr. on 220-440 volt, 3-phase 60 or 25 cycle AC	Jeffrey Mfg. Co.
Electric vibratory mixing conveyor	Standard section lengths and widths		Series of stepped plates produces side slip as material falls from one step to next. No degradation of materials or fines produced	Conveying materials being treated with infra-red or ultra-violet light, roasting or toasting processes		Jeffrey Mfg. Co.
Fork truck	30″ long, 83″ overall height, 102″ lift	Solid rubber tires	Battery charged	For narrow aisles, and interior floor use	Capacity 1000 lbs.	Baker-Raulang Co.
Fork truck	Collapsed height 83″, tiering height 130″		63″ of lift before increase in min. overall height of machine		Maximum load 4,000 lbs.	Clark Equipment Co.
Fork truck	6000 lb. capacity, 24″ load center 10′ sections			Heavy operations over extremely rough terrain, railroad tracks	Too large for confined areas	Clark Equipment Co.
Gravity roller conveyor			Gravity and power equipment enables complete materials handling installation to be set up			Speedways Conveyors, Inc.
Gravity wheel conveyor	Widths 12″-24″		Usable on both high and low sides	For moving boxes, cases, and cartoned material		Speedways Conveyors, Inc.
Hand-operated power truck	6000 lbs. capacity		Completely electric, platform model			Lewis-Shepard Products, Inc.
Heavy duty electric vibratory grizzly feeder	Single or double magnet		Variable control of feed rate with full or partial grizzly decks			Syntron Co.
Horizontal belt conveyor	21-161′ lengths, 28″, 32″, 36″ heights 14″ and 24″ belt widths		Operates at 60′ per min. in either direction. Takeup for maintaining belt tension incorporated within drive mechanism		Power up to 1 hp.	Standard Conveyor Co.
Hot materials conveyor belt		Fiberglas	Plies as strong as steel of equal weight, will not stretch		Will not char or lose strength from heat under 350 deg. F.	Hewitt-Robins, Inc.
Hydraulic high lift truck	3000 lb. capacity		Four wheel suspension, synchronized steering device, towing eye			Lyon-Raymond Corp.
Hydraulic-snubbed shovel attachment	All 3000-7000 lb. Clark fork trucks		Snubber absorbs shock when load is dumped	Handling bulk materials		Clark Equipment Co.
Lifter	1000, 2000 lb. capacity		Ball bearing hoist to lift full load with only 20-25 lbs. crank handle pressure. Automatic safety brake holds load at point raised	Loading and unloading motor trucks, double tiering drums, barrels, pallets		Economy Engineering Co.
Lift mechanism	Collapsed ht. 83″ tiering ht. 130″		Can pass through 7′ door with load, eliminating need for both low-lift and high lift fork trucks	Loading and unloading in storage or warehouse	Clark fork trucks with Max. cap. of 4000 lbs.	Clark Equipment Co.
Lift trucks	2,000-8,0000 lb. cap.		5,000 and 6,000 lb. units have collapsed ht. of 83″, lifting to 124″, 7,000 and 8,000 lb. units lift to 115″			Automatic Transportation Co.
Motorized wheelbarrow	81½″ long, loading ht. 31″		Powered by gasoline engine, controlled by tiller, dumping by means of a foot-operated latch, driving speeds 6-8 mph.		Holds 1500 lbs.	Gar-Bro Mfg. Co.
Multi-tier conveyor	As specified	Standard construction materials	Long distance travel and processing with a minimum of floor space, enclosed for heating, cooling, drying processes	Food processing, ceramics, rubber, petroleum by-products		J. W. Greer Co.
Oscillating trough conveyor	Widths 12-48″, lengths to 100′		Trough supported on a series of short arms and adjustable torsion bars	Conveying, also oscillator pan can be used for cooling or drying		Link-Belt Co.
Pallet rack and nesting ring		All metal	Permits easy handling of excessively heavy loads. Sturdy legs provide adequate height to permit complete accessibility from all sides	For heavy use, is suited for rapid handling of heavy irregular pieces or parts of various sizes		Palmer-Shile Co.

MATERIALS HANDLING —New Equipment Announced 1947-8 (Continued)

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Pallets and skids	All sizes	Douglas fir	Pallets for lift trucks, skids for transporters			Evans Products Co.
Pallet stacker unit	Several sizes	Steel	Collapsible self-contained attachment for safe easy stacking of crushable or varying sizes of merchandise		Pallet capacity 4000 lbs.	Elizabeth Iron Works
Pallet truck	2500 lb. capacity	Steel	Short overall length to lift pallet loads 66"	For double stacking of pallet loads		Yale & Towne Mfg. Co.
Platform electric truck	4000 and 6000 lb. capacity	Steel	Handles skids any clearance from 6" to 12"	Where skids of various heights are used		Yale & Towne Mfg. Co.
Pneumatic system			Entire system under reduced pressure, material does not pass through the pneumatic fan	Reduces product loss through collector exhaust. For abrasive materials		Sprout-Waldron & Co., Inc.
Pneumatic tired fork truck	42" overall width, 120" lift, 85½" overall height		Pivoted steering axle mounting and three-point suspension make for smooth operation. 9.4 mph. in high and 2.9 mph. in low both forward and reverse	For outdoor working or oil surfaces too uneven for solid tired machines	Capacity 400 lbs. in 24"	Clark Equipment Co.
Pneumatic tired fork truck	Tiering hts. 60-144"		Outside turning radius of 69", gas-powered	For interplant movement of material over rough and uneven surfaces	Capacity 2000 lbs.	Clark Equipment Co.
Portable belt conveyor	Extended lengths 21'6"-46'3"		Short closed length permits moving through confined areas. Permits inclines or declines	Conveying sacks, cartons, cases		Standard Conveyor Co.
Portable conveyor	14' and 20'	Rubber ply canvas belt	Hydraulic lift raises to any position from level to 37°. Equipped with pneumatic tires, powered by gas engine or electric motor	Handling all bulk materials		Sermat Conveyor Corp.
Portable elevator	22" x 24" platform, 68" ht.		Exceptionally maneuverable, equipped with firm floor lock, crank-up, crank-down hoist allows no gravity drop		Capacity 1000 lbs.	Revolvator Co.
Portable gravity conveyor	5', 6', 8', and 10' lengths, 12", 15", 24" widths	Aluminum	Portable, easy-to-handle	General use		Rapids-Standard Co., Inc.
Power driven curve	10" to 30" wide, 4" centers		Packages can be made to go around horizontal curves without being pushed manually	Joining horizontal belt table conveyors, belt conveyors, reversible floor to floor conveyors		Harry J. Ferguson Co.
Revolving carriage for fork lift truck			Carriage revolves in 360° circle in either direction with power supplied by a hydraulic motor through chain drive	Handling solid, liquid or granular bulk materials which require movement from one container to another		Towmotor Corp.
Rubber tired wheels	4-14" diameter		Available with sealed ball bearings, plain bronze or oil-impregnated sintered bronze bearings. Tires are demountable with ordinary hand tools			Champion Iron Works, Inc.
Self-dumping hopper			Handles all kinds of bulk materials, can be quickly attached to fork trucks			Lewis-Shepherd Products, Inc. Buda Co.
Shop truck	½, 1 ton		Hydraulic lift, compact enough to get in and out of narrow aisles, two brakes	Material handling such as pallet loading		
Side shifter for pallet trucks			Provides lateral movement of a load, hydraulically operated, will move carriage face and forks 3½" in either direction	Permits operator to pick up or deposit a unit load in an exact location without repositioning the truck itself		Towmotor Corp.
Telescopic tilting fork truck	2000 lb. capacity up to 48" load length, 3000 lb. capacity up to 28" load length	Steel	Min. height of 83" and max. fork lift of 120"	For low clearance and high stacking		Yale & Towne Mfg. Co.
Trough conveyor	16", 20", 24" belt widths, 20-60' lengths		Power from electric motor or gasoline engine	For handling of loose materials	Capacity 60 - 180 tons per hr.	Geo. Haiss Mfg. Co.
Troughed steel belt conveyors		Pre-troughed or self-troughed	Pre-troughed or self-troughing	Pre-troughed type for light, easy-flowing material, self-troughed type for heavy materials		Sandvik Steel, Inc.
V-belt	Fractional and multiple sizes	Nylon cords covered with synthetic rubber	High tensile strength, great flexibility and sufficient elasticity to absorb shock	For power transmission on equipment subject to rough usage		U. S. Rubber Co.
Wire rope hoists	¼, ½, 1 ton capacities	Steel frame	Drum has sufficient capacity to provide for full standard lift without overlapping of cable. Reversing-type motor rated for constant full-load service without destructive overheating		Light duty	Yale & Towne Mfg. Co.
Zipper conveyor elevator	4"		Conveys in any direction, entirely enclosed, without relative motion between belt and material	Granular solids	Will handle pulverized, granular or small-lump material at speeds up to 200' per min.	Stephans - Adamson Mfg. Co.

PIPE AND FITTINGS—New Equipment Announced 1947-8

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations	Company
COUPLINGS					
Anchor base expansion joint fittings	Various sizes	Stainless steel	Packless expansion joints		Cook Electric Co.
Corrosion resistant fittings	Standard range	Stainless steel			Allmetal Screw Products Co., Inc.
Flexible coupling			Center member, which has a free sliding action between the two jaw flanges absorbs wear. Bearing strips slide upon center block, reducing friction between bearing strips and flanges.		American Flexible Coupling Co.
Flexible tube connectors	To specification	Nylon fabric	Greater wear and abrasion resistance	Stockings for shaker screens, reels Up to 400°F.	Richmond Mfg. Co.

PIPE AND FITTINGS—New Equipment Announced 1947-8 (Continued)

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*		*Company*
Light gauge pipe fittings	¼-4" O.D.	Inconel, nickel monel, stainless steel	Lock ring presents simple and efficient method of joining with silver brazing or soft solder			Northern Indiana Brass Co.
Pipe coupling	2" (others later)		Special buffer ridge in gasket gives protection against chipping of pipe, provides for smooth flow and a tight seal	Glass or porcelain-lined pipe	Pressure to 250 psi., temperature to 180°F.	Drinkwater, Inc.
Rotary pressure joint	½", ¾", 1", 1¼"		Self-supporting, self-lubricating, packless, automatic adjustment	To admit heating or cooling agents to rotating rolls	150 psi. pressure, 400° F.	Johnson Corp.
Rotary pressure joint	½-1¼"	Cast iron with graphite rings and guides	Needs no external supports, packless, self-oiling, self-adjusting	Introducing steam or liquids under pressure into rotating drums	Pressure to 150 psi. temperature to 400°F.	Johnson Corp.
Rotary union	½"-2½" (also special sizes)	Monel bellows, cast iron housing	Bellows provide positive sealing, ball bearing construction, low friction drag, seal pressure automatically increased in proportion to applied pressure	Drying rolls or drums, mixers, rotary joint connections for steam, water or gases	Pressures to 250 psi	Perfecting Service Co.
Steam coupling	Various sizes		Permits quick connection and disconnection, adjustment of packing while under pressure		Pressure to 350 psi.	Hanson Mfg. Co.
Threadless socket type fittings		Black malleable iron	Design reduces pressure drop	For brazing steel to wrought iron	Pressure to 300 psi., temperature to 450° F.	Stanley G. Flagg & Co.
Tube fitting	¼"-1½"	Alloy steel sleeve	Fitting consists of connector body, tightening nut, and contractible sleeve which grips the tube with slotted spring steel fingers	Available in straight, union, elbow, side tee, tube tee, cross, both male and female		Flodar Corp.
Universal expansion joint			Capable of absorbing movement in any direction, non-equalizing type for pressures below 30 psi., self-equalizing type for higher pressures	Refineries, power plants, chemical process plants		Zallea Bros & Johnson
Welding fittings	½-12"	Carbon seel	Made from seamless tubes, wall of uniform thickness, precision cut bevel ends	For complex piping systems confined to small areas		Globe Steel Tubes Co.
PIPE & TUBING						
Armored tubing		Polyvinylchloride plastic covering	High corrosion resistance	Where thermometer installations are subject to strong chemical action	For all thermal systems except lead-covered or dual filled	Brown Instrument Co.
Corrosion resistant pipe and fittings	1-4" diam., 10' lengths	Saran-lined steel	Conventional tools may be used for cutting and threading, rigid and pressure resistant	Sulphuric, hydrochloric, nitric, phosphoric acids	Working temperature 0-190° F.	Dow Chemical Co.
Corrosion resistant pipe and fittings	½-2"	Polyethylene	Insoluble in all common solvents except chlorinated solvents and hydrocarbons at elevated temperatures	At normal temperature will withstand pressures up to 50 psi. without leakage		American Hard Rubber Co.
Corrosion resistant pipe and tubing		Copper-bearing stainless steel	Unusually good resistance to sulphuric acid			Carpenter Steel Co.
Corrosion resistant tubing		Stainless steel	Resistant to sulphuric acid	Synthetic rubber, gasoline, solvents, food processing		Carpenter Steel Co.
Flexible hose		Bronze	Provides metal-to-metal seat by means of a seal produced between the fitting body and spring washer effect of the hose. No brazing or packing required			Brockway Co.
Flexible tubing	Up to 3"	Plastic	Formulations in a range of colors, pressure, temperature, and corrosion requirements	Industrial and laboratory applications		Irvington Varnish & Insulator Co.
Flexible tubing	½-2" I.D., lengths up to 200'	Buna and neoprene base synthetics	Long life, ½" tubing will stand bursting pressure up to 1000 psi., other sizes proportionately less		Up to 300° F.	Ronaflex Tubing Co., Inc.
Flexible tubing		Monel	Four temperature ranges depending on type of solder used	Severe corrosion and high temperatures	Up to 1785° F.	Titflex, Inc.
Insulated piping	21' lengths, range of sizes	Asphalt covering, outer wrapping of copper or aluminum foil	Completely waterproof and corrosion resistant	Protection and insulation of overhead steam, hot water, oil, brine lines		Ric-wiL Co.
Piping system	2-12"	Stainless steel	Allows installation of stainless system without welding	Paper, food, chemicals	Not for high pressures because of light wall	Robinson Engineering Co.
Steam hose			Lowered hardening of tube and high pressure steam	cover after prolonged exposure to		B. F. Goodrich Co.
Vibration resistant tubing		Inconel	Resists failure caused by excessive vibration	Conditions where monel or brass would be affected	Temperatures up to 1700° F.	Titeflex, Inc.
NOZZLES						
Nozzle	¾" garden hose thread, ½" pipe thread	Phosphor bronze safety guard	Without interfering with spray spring guard protects the deflector face of the nozzle	Where nozzle is subject to accidental bumping		Spraying Systems Co.
Spray nozzle		Stainless steel nozzle body and retainer cap, tungsten carbine vortex chamber and orifice insert	High resistance to wear	Hollow cone spray pattern		Spraying Systems Co.
Spray nozzle		Bronze, any machinable material obtainable in bar stock	Production on automatic screw machines insures extreme uniformity	Air washing, brine refrigeration, chemical spraying		Binks Mfg. Co.

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*		*Company*
VALVES						
Anti-freeze water draw-off valve	2", 3", 4"	Bronze	New body design with shut-off valve inside tank to prevent freezing. Threaded for inner elbow to install standpipe to bottom of tank	For withdrawing water or liquid at bottom level on tank	Can be installed with bolted, riveted or welded flange	Vapor Recovery Systems Co.
Check valve	½-12"		No metallic operating parts, operates on low pressure differential			Grove Regulator Co.
Combination relief valve and gauge hatch	2-4"	Aluminum with non-sparking brass gauge hatch cover	New bonnet design for increased flow capacity, pressure-vacuum settings from ½ oz.-2 lbs...	For reducing evaporation and safeguarding small tanks	Tanks 500 bbl. and smaller	Vapor Recovery Systems Co.
Corrosion resistant relief valve	Screwed ends ½-1", flanged ends ½-2"	Hastelloy C	A flexible material such as Neoprene is used to isolate the working parts from gas or vapor within the valve body			Farris Engineering Corp.
Corrosion resistant valves	2½-6"	Monel, 18-8 Mo	Stem threads on outside of valve, stuffing box unusually deep, minimal leakage and resistant to flow	Handling corrosive materials	150 psi. up to 350° F.	Crane Co.
Diaphragm control valve	Screwed end ¼ to 1", flanged end 1-8"	Cast iron, cast steel, bronze, stainless steel	Venturi throat insures optimum in streamline flow characteristics	High pressures, Fischer - Tropsch plants	Pressures up to 30,000 psi., temperatures from —225 to 1000° F.	Hammel-Dahl Co.
Diaphragm motor valve			Cam-operated positioner. Replacement of one came with another permits retention of the advantages valve with flow characteristics typical of other types		on the positioner of the disc type	R-S Products Corp.
Diaphragm regulating valve		Cast steel, semi-steel, bronze	Single seated, tight closing main valves, integral hard-surfaced seats, easy reversal of valve action by simple change in diaphragm superstructure		Steam pressure to 600 psi., temperature to 800° F.	Leslie Co.
Diaphragm type valve		Duriron, Durichlor	Particularly resistant to sulphuric, nitric, and acetic acids, also hydrochloric acid below its boiling point. No stuffing box or packing.			Duriron Co., Inc.
Gage valve	⅛-1"	Carbon steel, stainless steel	New type handwheel	For gage, meter, small pipe lines	Up to 4000 psi. at 150° F.; 475 psi. at 1000° F.	Edward Valves, Inc.
Gas cock safety valve	⅜-½"		Positive main line shutoff during pilot lighting and reset operation. Complete operation by one handle rotated to positions indiacated on dial plate	Safety shutoff control for all types of gas appliances		General Controls Co.
Gate valve		Bronze	"Union bonnet" provides maximum distortion resistance, silicon alloy stem material eliminates stem-thread failures		Flange end rated 150 psi., screwed end rated 200 psi.	Lunkenheimer Co.
Gate valve	Screwed-end ½"-2", solder-joint ⅜"-2"	Brass	Good pressure resistance, cylindrical shape of body reinforces seats against wedging action of disc. Stuffing box packed with molded asbestos	For saturated steam up to 100 psi., water up to 125 psi. at 200° F.		Crane Co.
Gate valve	¼-3"	Bronze	Possible to convert from non-rising to rising stem by simple interchange of trimmings	Steam, water, oil, gas lines	150 psi.	Lunkenheimer Co.
Globe, angle and check valves	⅛-3"	Bronze	Elimination of stem-thread failures due to wear.	Steam, water, gas, oil pipe lines	125 psi.	Lunkenheimer Co.
Globe and angle valves	¼-3"	Bronze	Renewable parts, stainless steel plug type seat and disc.	For erosive or abrasive conditions	200 and 300 psi.	Lunkenheimer Co.
Handwheel control valve	2-12"		Possible to position the valve plug by hand in case of air failure			Hammel-Dahl Co.
Hose valve	¼-1"	Monel	Only two moving parts, palm-size, slight pressure required to hold open	Delivers 13 gal. per min. at 75 psi. line pressure		Paul Valve Corp.
Hydraulic valve	½-2"	Carbon steel, alloy steel	New type handwheel, body designed for low pressure drop	High pressure systems under 300° F.	Non-shock pressures up to 7500 psi. at 125° F.	Edward Valves, Inc.
Lubricated plug valve	1-4"		Positive circulation of lubricant by hydraulic pressure		175 psi. working pressure	Pittsburgh Valve & Fittings Corp.
Lubricated plug valve	Up to 12"	Steel, semi-steel, stainless steel	Double-sealed plug stem, lubricant grooves not exposed to fluid, easily changed from stick to pressure-gun lubrication	Where positive, accurate, leak-proof control is required		H. K. Porter Co.
Magnetic gas valve	⅜-1¼"		Hermetically sealed operator	Industrial furnaces, gas - fired boilers		General Controls Co.
Microflo valve	15 sizes below ⅛"	Steel, stainless steel, Hastelloy	50-1 range, valve flow coefficient of .63 down to .001"	Extreme high pressure pilot plant operation	Unsuitable where gummy material will deposit, up to 15,000 psi.	Hammel-Dahl Co.
Microneedle valve	⅛" and ¼"	Brass, aluminum alloy	1/16"-40 stem threading for close adjustment, long 10° included angle tapered needle for fine metering	Sensitive metering of fluids		Parker Appliance Co
Non-lubricated selector valve	½-1¼"	Graphite rotor	Permits the inter-connection of up to five separate lines. Line pressure is used to effect a seal when closed	Handling air, gases, hot liquids	Temperatures up to 400° F., non-shock pressures up to 500 psi.	Parker Appliance Co
Non-lubricated shut-off valve	½-2"	Graphite rotor	Rotor has central passage at right angles to cylindrical axis permitting straight-through flow when lined up with valve ports	Handling air, gases, hot liquids	Temperatures up to 400° F., non-shock pressures up to 500 psi.	Parker Appliance Co
Nozzle type angle relief valve	¾"x¾" to 6"x8"	Steel, semi-steel or bronze body, stainless or monel trim	Venturi nozzle and hyperbolic valve plug design for increased flow and minimum blow-down	High pressure relief in water, oil, steam or gas service	Pressure to 1000 psi., temperature to 900° F.	Vapor Recovery Systems Co.
Pressure reducing and regulating valve	1¼",1½",2"	Bronze	Yoke type construction, neoprene seat		Up to 250 psi.	Cash-Acme Co.
Pinch valve	1-10"	Rubber tnbe, semi-steel frame, stainless steel stem	Opening and closing rapidly, or at long intervals	For flow of highly abrasive and corrosive materials		Farris Engineering Corp.
Relief valve	¼"-¾", larger on special order		Shut-off piston guided for quick unloading and smooth, silent operation		0-1000 psi.	Parker Appliance Co.

PIPE AND FITTINGS—New Equipment Announced 1947-8 (Continued)

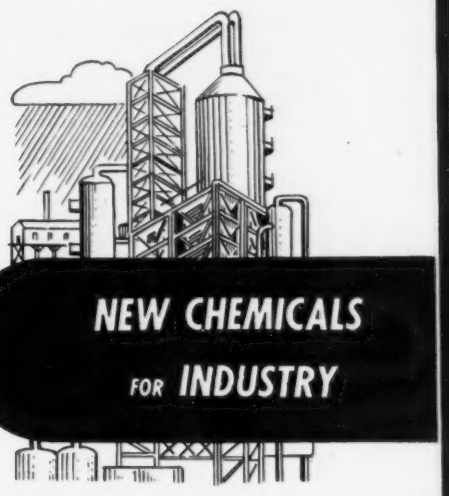
Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*		*Company*
Safety relief valve	1½"x2" to 6"x8"	Cast steel with stainless steel trim	High disc lift permits full capacity discharge, alignment spool holds disc and stem in perfect alignment	For handling corrosive materials	Pressure up to 2000 psi., temperature up to 900° F.	Farris Engineering Co.
Safety valve		Nylon disc	Nylon will not flow or creep under spring compression nor stick or weld itself to the seat	Meets A.S.M.E. requirements for air compressor service		Manning, Maxwell & Moore, Inc.
Sealed globe and Y valves	¼-12"	Variety of metals and alloys	Entirely enclosed bellows with life of more than 1,000,000 cycles. Joints at body neck flange and on top of disc seal the interior of the valve from fluid being handled	For high vacuum service, and where packing is unsatisfactory		Wm. Powell Co.
Solenoid valve	¼-3"	Cast iron or bronze bodies, stainless steel seat	Direct operated, no auxiliary pistons	Viscous fluids	Differential pressures to 150 psi., temperature to 400° F.	Johnson Corp.
Spring check valve	⅛", ¼", ⅜", ½", ¾"	Bronze	Piston operated, spring-loaded, operates with minimum of noise, provides positive non-leaking check to water, oil or gas	Air compressors, gas pumps		Pokorney Mfg. Co.
Swing Check valve	¼-6"	Bronze, aluminum and grey iron	Sensitive to low flow, full flow through valve with minimum resistance, non-leaking through check			Pokorney Mfg. Co.
Swing check valve		Various alloys	Body made in one piece eliminating bonnet flanges, no gaskets	For horizontal or vertical operation		Cooper Alloy Foundry Co.
Swing check valve	¼-6"	Monel, 18-8 Mo	Piping corrosive fluids at pressures up to 150 psi and temperatures up to 350° F.			Crane Co.
Vacuum tight valve	1-4"	Stainless steel bellows, silicone rubber disc and gasket	Valve opens sufficiently to give 1½ times the pumping area through the valve as equivalent pipe size of valve connections	High vacuum processes, especially in presence of mercury vapors	Temperature to 350° F., pressure to 40 psi.	Kinney Mfg. Co.
Valve	¼-2"	Stainless steel	All materials in contact with fluid corrosion resistant			Ohio Injector Co.
Valve	¼-2"	Stainless steel	Non-graphited asbestos packing		For corrosive applications	Ohio Injector Co.
MISCELLANEOUS						
Filter	Filter area 18"² to 24"²		Passageways readily cleaned, elements easily replaced	Cylindrical element for low pressure, bayonet element for high pressure, star type element for large installations	Filter bodies for normal 200 psi.	Micro Metallic Corp.
Gas diffusion tube		Stainless steel wound with Saran	Thin-wall construction reduces depth-clogging and provides for easier cleaning, uniform fine-bubbled diffusion at all air rates			Chicago Pump Co.
Gasket		Polytetrafluoroethylene	Resistant to organic liquids, do not stick to flanges or become coated with process materials		Temperatures from —200 to 500° F.	U. S. Gasket Co
Offset strainer	1½-12"	Bronze, steel, semi-steel, iron, alloys	Permits strainer to be completely drained as the line itself is drained	Can be installed to form a right angle connection in a piping system	125-300 psi.	J. A. Zurn Mfg. Co.
Packing		Teflon and any suitable metal jacket		Pumps, valves, lines		U. S. Gasket Co.
Packing	⅛"-1"	Teflon	Not affected by solvent, acid or caustic solutions up to 690° F.	Packing valves, centrifugal and rotary shafts, reciprocating rods		Crane Packing Co.
Packing and sealing		Felt and Hycar	Self-lubricating, positive sealing, excellent resistance to oils and fluids	Mechanical sealing, packing and gasketing materials		American Felt Co.
Pipe joint compound			Large diameter stick for larger threaded pipe			Lake Chemical Co.
Pipe threading machine	For ½-2" piping (can be extended to 12")		Will cut, chamfer, ream and thread ½-" pipe without changing dies	Pipe installation and maintenance		American Die & Tool Co., Inc.
Porous metal filters and diffusers	Various sizes and shapes	Various metals and alloys	High mechanical strength, lowered retention time in separation of coagulated solids in water treatment	Filtering liquids, control flow of liquids and gases		Henry L. Crowley & Co.
Pressure regulator diaphragm	Sheets 36" wide, various thicknesses	Nylon combined with rubber	Greater flexibility, lighter weight, higher bursting strength, improved sensitivity compared to conventional sheepskin or cotton duck			U. S. Rubber Co.
Reversing superstructure			Permits reversing valve action by substitution for the standard superstructure without removal of valve body from line	For use on diaphragm regulating valves		Leslie Co.
Roller Pipe supports	For 1-12" pipe		Supporting rings of solid rollers have slope of 30°			Unistrut Products Co
Seamless reducing welding elbow	2"x1" to 5"x6"		Eliminates cost of extra weld and additional fitting, reduced flow resistance	For 90° change in direction combined with reduction in pipe size		Ladish Co.
Strainer	1-6", larger sizes to order	Bronze, steel, semi-steel, alloys	Two baskets permit flow to continue while cleaning by diverting flow from one basket to the other			J. A. Zurn Mfg.
Thread compound			Prevents freezing and galling of metal surfaces	High temperature, high pressure applications such as furnace tube head studs and plugs	Up to 1800° F.	Fel Products Mfg. Co.
Valve reseating tool	For ½-3" valves		No special guides or jigs required, not necessary to dismantle bonnet and stem assembly of valve			Grace Products Co.
Y strainer	Various sizes	Cast iron, cast steel, bronze, brass	Pressure drop reduced to a minimum, provided with bolted blow-off connection	For close quarter and normal installations	Up to 600 psi.	J. A. Zurn Mfg. Co.

ADDRESSES OF MANUFACTURERS LISTED IN THIS SECTION WILL BE FOUND ON PAGE 476.



New chemicals go through their paces at the experimental station of B. F. Goodrich Chemical Co. at Avon Lake, Ohio.

NEW CHEMICALS FOR INDUSTRY



CHEMICAL INDUSTRIES presents here a catalog of new chemicals and chemical specialties introduced by its advertisers since September, 1947. None of these materials has been listed in previous CHEMICAL INDUSTRIES compilations. Samples of these products will be displayed at CHEMICAL INDUSTRIES' exhibit (booths 66-67) at the National Chemical Exposition, Chicago Coliseum, October 12-16.

2-ACETAMIDOTHIOPHENE

$C_4H_3S \cdot NHCOCH_3$. M.W. 141.19; M.P. 158°-160° C.; fine tan colored crystals. Chemically resembles acetanilide and affords a starting point for the synthesis of other thiophene analogs of drugs, etc., which are customarily derived from acetanilide. Available in research quantities. Arapahoe Chemicals, Inc.

ACETOACET ORTHOANISIDIDE

$C_6H_4OCH_3NHCOCH_2COCH_3$. M. W., 217.2; M. P., 84° C.; white crystalline solid @ 20° C. Chemical properties: forms Hansa and benzidine azo pigments; the methylene group is active in coupling; will also cyclize to form substituted quinolines or carbostyrils. Uses: pigment intermediate. Available in limited commercial quantities. Carbide and Carbon Chemicals Corp.

ACETONE CYANOHYDRIN

Alpha-Hydroxyisobutyronitrile. $(CH_3)_2C(OH)CN$. M.W., 85; B.P., 82° C/23 mm.; M.P., -19° C.; Sp. Gr., 0.925/25° C.; purity 97-98%; sol. in water, alcohol, insol. in pet. eth. Principal uses: Chemical intermediate. Rohm & Haas Co.

ACETYL TRIHEXYL CITRATE

The acetylated ester of citric acid and n-hexyl alcohol. Has a very low vapor pressure, as well as very low water-solubility. M. W., 487.7; assay, over 99%; Sp. G. (@ 25° C.), 1.008; R. I. @ 26° C., 1.4456; heat test (1 hr. @ 150° C.), satisfactory; acidity, 0.002%; B. P. over 200° C. @ 1 mm. Suggested use: Plasticizer for vinyl resins. Available in pilot plant quantities. Chas. Pfizer & Co.

ACETYL TRIOCTYL CITRATE

The acetylated ester of 2-ethyl hexyl alcohol and citric acid. Very low volatility and water solubility. M. W., 571.7; assay over 99%; Sp. G. (@ 25° C.), 0.983; R. I., @ 25° C., 1.4505; heat test (1 hr. @ 150° C.), satisfactory; acidity, 0.003; B. P., over 200° C. @ 1 mm. Suggested use: Plasticizer for vinyl resins. Available in pilot plant quantities. Chas. Pfizer & Co.

ALLYL CYCLOHEXANEPROPIONATE

An aromatic, its character being that of a fresh, natural pineapple. A light colored liquid soluble in all essential oils and alcohol. While its main use is in the composition of pineapple flavors, desirable effects can be obtained by small amounts in strawberry and raspberry flavors. It is much smoother and more stable than allyl caproate and various other pineapple esters. Commercially available. Dow Chemical Co.

ALLYL DIPHENYLACETIC ACID

$(C_6H_5)_2C(COOH)CH_2CH{=}CH_2$. A chemically pure, white, crystalline material; melting point 141.5-143.5°C. Soluble in organic solvents, sodium salt soluble in water. Chemical reactions: Forms an acid chloride with thionyl chloride. Amides may be formed from the above chlorides. Forms a lactone in the presence of acids. Forms the bromo-lactone with bromine. Suggested uses: pharmaceutical intermediate for the preparation of analygesics, local anesthetics, anti-spasmodics, hypnotics. Availability: small quantities for experimental investigation. General Mills Research Laboratories.

ALLYL STARCH

Slightly yellow colored solid which polymerizes on contact with air; soluble in alcohols, ketones, esters, ethers, glycols, etc.; insoluble in aliphatic hydrocarbons. In solution, 40-50% solids concentration is stable in air and may be stored without danger of gelation. It dries rapidly and cures to a hard film, resistant to solvents and acids, with fair resistance to water and alkalis. Suggested uses: metal coating, bonding agent, grease proofing material, acid resistant coatings, lacquers and varnishes, and printing inks. Availability: Pilot plant quantities. General Mills Research Laboratories.

ALUMINUM POTASSIUM CHLORIDE

$AlKCl_4 \cdot 6H_2O$. M. W., 315.9; white crystals; readily soluble in water with slightly acidic reaction. City Chemical Corp.

dl-a-AMINOBUTYRIC ACID

An amino acid of interest as an intermediate. Available in experimental quantities. Dow Chemical Co.

2-AMINO-4-NITROPHENOL

$C_6H_6O_3N_2$. M. W., 154.12; M. P., 142-143° C.; Slightly soluble in water; very soluble in alcohol, ether; yellow needles; stable. Chemical properties: Will give reactions attributable to all three groups. Reduces very easily. Suggested uses: Dyes; dye applications; photographic compounds; organic synthesis. Availability: Research quantities. Genesee Research Corp.

PARA-AMINOSALICYLIC ACID (4-AMINO-2-HYDROXYBENZOIC ACID)

M.W., 153.13. M. P., decomposes 135°-151° dependent on method. A cream colored powder relatively insoluble in cold water (less than 0.1%). Practically insoluble in hydrochloric and sulfuric acids but soluble in phosphoric acid. Soluble in ethanol. Alkaline salts are soluble in water. Suggested for use in pharmaceutical field especially for treatment of tuberculosis. Available in limited quantities. Allied Chemical & Dye Corp., National Aniline Division.

2-AMINOTHIOPHENE (TIN CHLORIDE DOUBLE-SALT)

$(C_4H_3S{\cdot}NH_2{\cdot}HCl)_2SnCl_4$. M. W., 531.22; M. P., 222°-224° C. (dec.); fine tan colored crystals. Chemically this material is equivalent to the unstable 2-aminothiophene and thus affords a starting point for the synthesis of thiophene analogs of many of the drugs, etc., which are customarily derived from aniline. Available in research quanties. Arapahoe Chemicals, Inc.

AMMONIUM HEXAFLUOROPHOSPHATE —FLUORIDE

$NH_4PF_6 \cdot NH_4F$. M. W., 200.06; sublimes at about 140° C. Solubility: about 60 g. per 100 g. water at 95° C., much less soluble in cold water; somewhat soluble in ethanol and in acetone. Solutions are neutral or slightly acid, stable, inert toward glass unless too acidic. Solid is inert toward glass, vapors on sublimations do attack glass to give uniform, cloudy etch. Availability: experimental quantities. Ozark-Mahoning Co.

ANTIMONY PENTAFLUORIDE

SbF_5. M. W., 216.76; Sp. G. liq. 2.99 @ 23° C.; M. P., 70° C.; B. P. 149.5° C.; miscible with H_2O; sol. in KF. Suggested use: as a source of elemental fluorine in fluorination reactions. Available in semi-commercial quantities. Allied Chemical and Dye Corp., General Chemical Division.

ARSENOUS BROMIDE, DISTILLED

$AsBr_3$. M. W., 314.7; yellow crystals or liquid. Melts at 31-32°. Boils at 220-221°. Soluble in water with hydrolysis, soluble in alcohol, carbon tetrachloride and ether. Suggested use: Medicinal. City Chemical Corp.

ASCORBYL PALMITATE

$C_{22}H_{38}O_7$. M. W., 414.54. Prepared by the esterification of palmitic acid with ascorbic acid, linkage taking place at the sixth carbon of the ascorbic acid. M.P., 116-117° C. Specific Rotation, 21-24°. Somewhat soluble in most organic solvents, such as ether, chloroform, alcohol, as well as animal and vegetable oils. Slightly soluble in water. Very low order of toxicity. Suggested uses: Antioxidant wherever fat and oil solubility is of interest, source of vitamin C, stabilizer and emulsifier. Available in development quantities. Chas. Pfizer & Co.

BENZILIC ACID

$C_6H_5C(OH)(COOH)C_6H_5$. M.W., 228.24; M. P., 148.5°-150.5° C.; soluble in hot water, alcohol, ether; assay 99-100% white to light tan powder. Chemical properties: both the hydroxyl and carboxyl groups undergo the usual reactions. Suggested uses: As an intermediate in organic syntheses. Commercially available. Heyden Chemical Corp.

BENZYL DIMETHYLAMINE

$C_6H_5CH_2N(CH_3)_2$. Mol. wt. 135. B.P. at 760 mm. 180-182°C. Sp. gr. 0.907. Purity 95-96%. Sol. in H_2O 1.098%. Reacts with organic halides to produce quaternary ammonium compounds. May also be of interest as corrosion inhibitor, dehydrohalogenating catalyst and acid neutralizer, as well as in reactions of the benzene ring such as chlorination and nitration. Available in pilot plant quantities. Rohm & Haas Co.

BENZYL THIOBENZOATE

$C_6H_5COSCH_2C_6H_5$. M.W., 228.29; M.P., 37°-39° C.; colorless to pale yellow crystalline material of characteristic odor. Suggested uses: perfume and insecticide preparations. Available in research quantities. Arapahoe Chemicals Inc.

BERYLLIUM CARBONATE

$(BeO)_3 \cdot CO_2 \cdot 5H_2O$. M. W., 259.2; white powder; insoluble in water, soluble in acids. City Chemical Corp.

BORON TRIFLUORIDE—PHENOL COMPLEX

$BF_3 \cdot 2C_6H_5OH$. 26% BF_3 by weight; freezing pt. 2.5° C.; Sp. G., 1.2185 @ 25° C.; a tan-colored liquid useful as a convenient source of BF_3. Suggested uses are similar to those of boron fluoride etherate, i. e.: as a catalyst in polymerization, esterification, cyclization, and condensation reactions. Available in semi-commercial quanties. Allied Chemical and Dye Corp., General Chemical Division.

para-BROMOBENZONITRILE

C_7H_4NBr. M.W., 182.03. M.P., 113-114° C.; B.P., 235- 237°C.; soluble in hot water; soluble in alcohol; very soluble in ether; off-white needles; darkens on heating or long standing in air. Chemical properties: Gives common reactions attributable to both the halogen and nitrile group. Suggested uses: Organic synthesis. Availability: Research quantities. Genesee Research Corp.

BROMODICHLOROMETHANE

$CHBrCl_2$. M.W., 163.8; B.P., 90° C.; Sp. G., $\frac{15}{4}$, 2.01; n_D^{15}, 1.501. Clear, colorless liquid with sweet odor. Non-inflammable, mobile, soluble in most organic solvents. Uses: pharmaceutical and organic synthesis. Availability: Semi-commercial. Michigan Chemical Corp.

4-BROMO-1, 3-DIMETHYL BENZENE

C_8H_9Br. M.W., 185.07; B.P., 158-159C°. 100 mm.; Insoluble in water; very soluble in alcohol, ether; light yellow liquid; colors on standing or heating. Chemical properties: Gives normal reactions of halogen, and those of side chain alkyl groups. Suggested uses: Organic synthesis. Availability: Research quantities. Genesee Research Corp.

BROMO-TERE-PHTHALIC ACID

$C_8H_5O_4Br$. M.W., 245; M.P., 299-300° C.; Soluble in hot water; soluble in alcohol; in soluble in ether and benzene; White powder; Stable. Chemical properties: Gives standard reactions of carboxyl group and will also give reactions attributable to the bromine group. Suggested uses: Derivative for alcohols; plastics; organic synthesis. Availability: Research quantities. Genesee Research Corp.

2-BROMOTHIOPHENE

C_4SH_3Br. M.W., 163.05; Sp. G. $\frac{20}{20}$°C.; 1.710; B.P., 151° C.; n_D^{20}, 1.5867; color, water white; odor, like bromobenzene; insoluble in water. Permits the synthesis of chlorothienyl analogues of compounds containing the chlorophenyl radical. Forms Grignard reagents by the usual methods. Useful in pharmaceuticals, dyes, perfumes, economic poisons, and other organic syntheses. Available in commercial quantities. Michigan Chemical Corp.

BROMOTRICHLOROMETHANE

$CBrCl_3$. M.W., 198.3; B.P. 104° C.; Sp. G. $\frac{0}{4}$, 2.055; n_D, 1.530. Clear, colorless liquid with sweet odor. Non-inflammable, mobile, soluble in most organic solvents. Uses: Organic synthesis, influencing course of polymerization reactions. Availability: Semi-commercial. Michigan Chemical Corp.

n-BUTYL BENZENESULFONATE

$C_6H_5SO_3C_4H_9$. M.W., 214.27; B.P., 150° C. (4 mm.; Sp. G., 1.153 at 25° C./25° C; Sol. in water, 0.02% at 25° C.; sol. in benzene, propylene dichloride, ethyl alcohol, ethyl acetate and ethylene glycol. Color: pale yellow. Chemical properties: Can be hydrolyzed by caustic. Suggested uses: alkylating agent, plasticizer and curing accelerator. Availability: Semi-commercial quantities. Wyandotte Chemicals Corp.

n-BUTYL METHACRYLATE

$CH_2{=}C(CH_3){-}CO_2C_4H_9$. M.W., 142; B.P., 163-164° C.; Sp. G., 0.895/25° C.; flash point 52° C. Principal uses. Potting compounds, cement for optical glass, polymerization. Rohm & Haas Co.

t-BUTYL PERMALEIC ACID

$(CH_3)_3CO_2COCH{:}CHCOOH$. M.W., 188.2; purity, 95% minimum; active oxygen, 8.1% minimum; M.P., 114°-116° C. (decomposes). White crystalline solid, very soluble in alcohols and 5% cool alkaline solutions, moderately soluble in oxygenated organic solvents and polyester monomers, slightly soluble in ligroin, carbon tetrachloride, chloroform and water, insoluble in benzene. A versatile polymerization catalyst useful over a wide range of temperatures with a variety of synthetic resins. Applications in aqueous bleaching and as a pharmaceutical are possible because of slight water solubility and ease of forming stable solutions with alkalies. Available in pilot plant quantities. Lucidol Div., Novadel-Agene Corp.

t-BUTYL PERPHTHALIC ACID

$(CH_3)_3CO_2COC_6H_4COOH$. M.W., 238.2; purity, 95% minimum; active oxygen, 6.4% minimum; M.P., 96°-99° C. White crystalline solid (95% through #12 sieve), very soluble in alcohols and 5% cool alkaline solutions, moderately soluble in other oxygenated organic solvents, halogenated hydrocarbons and polyester monomers, slightly soluble in petroleum solvents, insoluble in water. A versatile polymerization catalyst useful over a wide range of temperatures with a variety of synthetic resins. Soluble alkali metal salts are easily prepared and may be considered for applications requiring a water soluble oxidizing agent. Available in pilot plant quantities. Lucidol Div., Novadel-Agene Corp.

CADMIUM AMMONIUM BROMIDE

$CdBr_2 \cdot 4NH_4Br$. M.W., 664.1; white, crystalline; soluble in water and alcohol. City Chemical Corp.

CADMIUM AMMONIUM CHLORIDE

$CdCl_2 \cdot 4NH_4Cl$. M.W., 397.3; white, crystalline; soluble in water. City Chemical Corp.

CADMIUM BICHROMATE

$CdCr_2O_7$. Dark brown deliquescent crystalline mass, readily soluble in water. City Chemical Corp.

CALCIUM BROMIDOLEVULINATE

$Ca_2(C_5H_7O_3)_2Br_2 \cdot 4H_2O$. M.W., 542. Ca = 14.75%; Br = 29.5%. White, slightly hygroscopic, odorless powder. Soluble in water 50% @ 25° C; slightly soluble in alcohol; insoluble in ether, chloroform. pH app. 7.5. A synergistic association of calcium and bromide ions suggested for use as a sedative and in the treatment of allergic conditions. Availability: In commercial quantities. Chemo Puro Mfg. Corp.

CALCIUM CHLORIDE, BASIC

$Ca(OH)Cl{\cdot}\frac{1}{2}H_2O$. M.W., 110. White crystalline powder or granules, odorless, non-hydroscopic. Soluble in many acid solutions. When added to water forms calcium chloride and calcium hydroxide; added to acetic acid it forms calcium chloride and calcium acetate. Suggested uses: Firming agent for canned tomatoes, canned fruits. A non-hygroscopic source of calcium chloride. Commercially available. Mallinckrodt Chemical Works.

CALCIUM MONOFLUOROPHOSPHATE

$CaPO_3F \cdot 2H_2O$. M.W., 174.09. Stable at 110° C., loses water at about 170° C., additional decomposition at higher temperature. Solubility: less than 1 g. per 100 g. water. When heated to about 400°, vapors from salt etch glass. Availability: Experimental quantities. Ozark-Mahoning Co.

CALCIUM PHOSPHOTUNGSTATE

$2CaO \cdot P_2O_5 \cdot 12WO_3 \cdot xH_2O$. White crystalline mass; very soluble in water, insoluble in acetone. City Chemical Corp.

CALCIUM SUCCINATE

$CaC_4H_4O_4 \cdot 3H_2O$. M.W., 210. Ca = 19%; Succinic acid = 56%; Anhydrous salt = 74.25%. White, odorless, crystalline powder. Slightly soluble in water, soluble in dilute acids. Use: Succinic acid plays an important role in the intermediary metabolism of carbohydrates and fats, by greatly increasing oxygen utilization of the tissues. Since impairment of tissue oxidation has been demonstrated in arthritis, and because calcium succinate diminishes the toxicity of salicylates, it is used with salicylates, in the treatment of arthritis and rheumatism. Availability. In commercial quantities. Chemo Puro Mfg. Corp.

m-CHLOROBENZOTRIFLUORIDE

$ClC_6H_4CF_3$ (*m*-chlorotrifluoromethylbenzene). M.W., 180.56; Sp. G., 1.351 at 15.5°/15.5° C.; R.I., 1.446 at 20° C.; B.P., 138° C.; F.P., -56° C.; Flash P., 50° C.; colorless, aromatic liquid, characterized by the trifluoromethyl group which is generally stable to light, heat and chemical reaction. Suggested uses: Dyestuff and chemical intermediate. Availability: Pilot plant quantities. Hooker Electrochemical Co.

o-CHLOROBENZOTRIFLUORIDE

$ClC_6H_4CF_3$ (*o*-chlorotrifluoromethylbenzene). M.W., 180.56; Sp. G., 1.379 @ 15.5°/15.5° C.; R.I., 1.456 @ 20° C.; B.P., 152° C.; F.P., -7.4° C.; Flash P., 59° C.. Colorless, aromatic liquid, characterized by the trifluoromethyl group which is generally stable to light, heat and chemical reaction. Suggested uses: Dyestuff and chemical intermediate. Availability: Pilot plant quantities. Hooker Electrochemical Co.

p-CHLOROBENZOTRIFLUORIDE

$ClC_6H_4CF_3$ (*p*-chlorotrifluoromethylbenzene). M.W., 180.56.; Sp. G., 1.353 @ 15.5°/15.5°C.; R.I., 1.446 @ 20° C.; B.P., 139.3° C.; F.P., -36° C.; Flash P., 47° C. Colorless, aromatic liquid, characterized by the trifluoromethyl group which is generally stable to light, heat and chemical reaction. Suggested uses: Dyestuff and chemical intermediate. Availability: Pilot plant quantities. Hooker Electrochemical Co.

CHLOROBROMOMETHANE

CH_2BrCl. M.W., 129.40; B.P., 67° C.; Sp. G., $\frac{25}{25}$° C., 1.930; M.P., -86.5° C.; n_D, 1.480; bromine content, 61.7%. Clear, colorless, volatile liquid with sweet odor like chloroform. Non-inflammable, mobile and with extremely low freezing point. Soluble in most organic solvents, very slightly soluble in water. Specially purified to meet the requirements of the fire extinguisher industry. Uses: Fire extinguishing agent, solvent, organic syntheses. Availability: Commercial. Michigan Chemical Corp.

2-CHLORO PYRIDINE

C_5H_4ClN. M.W., 113.49; Sp. G., 1.205 @ 15° C.; B.P., 166° C (714 mm). Oil of pyridine like odor; insoluble in water, soluble in most organic solvents. Chemical property: Chlorine may enter into chemical reactions. Uses: In the synthesis of pharmaceuticals and other organic chemicals, strong fungicide. Commercially available. Fairmount Chemical Co.

2-CHLOROTHIOPHENE

C_4SH_3Cl. M.W., 118.59; Sp. G., $\frac{20}{20}$° C., 1.290; B.P., 126° C.; M.P., -69 to -70° C.; n_D^{19}, 1.5506; color, water white; odor, like chlorobenzene; insoluble in water. Permits the synthesis of chlorothienyl analogues of compounds containing the chlorophenyl radical. Grignard reagents may be made by a special process. Used commercially in pharmaceuticals and useful in dyes, perfumes, economic poisons, and other organic syntheses. Available in commercial quantities. Michigan Chemical Corp.

COBALT GLUCONATE

$Co(C_6H_{11}O_7)_2$. M.W., 449. A pink, stable powder, soluble in water. Use: Since cobalt has recently been shown to activate Penicillin, this organic compound may be of value in the compounding of Penicillin products. Availability: For investigational use. Chemo Puro Mfg. Corp.

COBALT IODIDE (ANHYDROUS)

CoI_2. M.W., 312.8; deliquescent, black crystalline mass. Very soluble in water, dilute mineral acids, very slightly soluble in alcohol and acetone. City Chemical Corp.

COBALT OXALATE

$CoC_2O_4 \cdot 2H_2O$. M.W., 182.97; rose-red powder; insoluble in water, soluble in dilute mineral acids, ammonia, solutions of ammonium carbonate and alkali oxalates. City Chemical Corp.

COBALT TRIFLUORIDE

CoF_3. M.W., 115.94; Sp. G., 3.88 @ 4° C.; fine buff-colored powder; chemical properties: hydrolyzes rapidly in the presence of moisture, an active fluorinating agent. Suggested use: As a fluorinating agent reacting with hydrocarbons or partly halogenated hydrocarbons to yield fluorine derivatives by replacement of hydrogen with fluorine. Available in commercial quantities. Allied Chemical and Dye Corp., General Chemical Division.

COPPER AMMONIUM CHROMATE

$CuCrO_4 \cdot (NH_4)_2CrO_4$. M.W., 311.67; green crystals, slight odor of ammonia. Soluble in water. Decomposed by heating. City Chemical Corp.

COPPER BICHROMATE

$CuCr_2O_7 \cdot 2H_2O$. M.W., 315.6; dark brown-

(*Turn to page* 432)

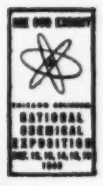
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NEW PRODUCTS & PROCESSES

Sludge Acid Recovery NP 737

A flexible, low-temperature process for sludge acid recovery which produces a gas higher in SO_2 content than that of burning pure sulfur has been developed by Monsanto Chemical Co. The new continuous process, known as the Monsanto-Ross-Wilde process, is flexible enough to operate efficiently on any strength refinery acid waste sufficiently fluid to be pumped.

Recorded over long periods of operation, the process yields over 98% of the recoverable sulfuric acid of the sludge feed. Gas leaving the decomposer unit shows a strength of 70-90% SO_2. After combustibles have been removed, this gas strength is actually higher in SO_2 content than that of gas obtained by burning pure sulfur. It is particularly suited for production of sulfuric acid by the contact process, and for the production of liquid SO_2. The sludge should contain a minimum of .08 lbs. of hydrocarbons per pound of titratable H_2SO_4.

Because of the unit's relatively low-temperature requirements and gas-tight chambers which operate under a slight negative pressure, it is unusually clean in operation. Hydrocarbon evaporation is limited to only the lightest fractions. By-product coke is handled in a sealed conveyor.

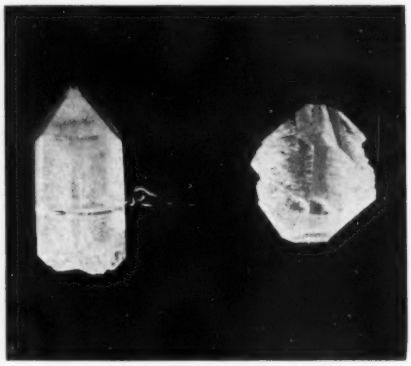
Plasticizer for Vinyls NP 738

The Hardesty Chemical Co. is introducing dicapryl sebacate as a plasticizer for vinyls. It imparts flexibility which is maintained down to extremely low temperatures (does not crack at –75° F.), a quality which is reflected in good hand over normal temperature variations. The resistance of dicapryl sebacate plasticized vinyl film to volatility loss is excellent, being reported as less than 1% loss in 24 hours at 250° F. in a moving air current. Excellent water resistance, light and aging resistance characteristics are attributed to this plasticizer, which permits a wide range of pigments and color combinations.

Synthetic Quartz Crystals NP 739

Quartz crystals, identical to those produced by the processes of nature, are now being grown inside steel "test tubes" by Bell Telephone Laboratories.

The crystallographers can grow a clear crystal more than an inch long in a



month. Due to the controlled uniformity of such production, the synthetic crystals are superior to natural ones.

Natural quartz crystals and their synthetic cousin, known as EDT (ethylene diamine tartrate) are widely used in telephone communication. Both the real and synthetic product are piezo-electric, which means that they can convert mechanical energy to electrical energy or vice versa. When electrical current is applied to them, they vibrate at certain specific frequencies. Quartz is also used extensively in maintaining frequency standards in radio.

The material from which the quartz crystals are grown is a finely powdered form of silica. This is placed in the bottom of the steel bomb and an aqueous alkaline solution is added. The seed plate, a thin wafer of quartz, is suspended at the top of the bomb; the bomb is then sealed and placed in a furnace.

Under pressures exceeding 15,000 psi. and at temperatures of about 750° F., the silica dissolves. In its dissolved state, it rises to the cooler part of the bomb and is deposited on the seed plate, molecule upon molecule, in perfectly regular order until all of it is in the form of a single clear crystal.

Alumina Powders NP 740

Two high-purity alumina powders of extremely small and uniform ultimate particle size are now available in commercial quantities from the Linde Air Productes Co. Type A consists of hexagonal crystals while type B is cubic. These abrasives may be used dry or mixed with water or other vehicles to make a thin slurry or paste. Other possible uses include as catalyst carriers and in phosphor preparation for lighting.

Molding Compound NP 741

A new, highly translucent melamine-formaldehyde molding compound is being introduced by the American Cyanamid Co. The new material, Melamac 404, was developed specifically for use in the manufacture of high-gloss buttons and is currently available in limited quantities.

Label Cement NP 742

Paisley Products, Inc. cement No. 1705 is a compounded synthetic rubber cement offered for labeling tin cans, metal pails, etc. that are later subjected to subzero freezer temperatures. Labels put on in 35° F. room, then subjected to subzero freezer storage for 30 to 90 days, hold securely when defrosted. The cement is white in color, can be diluted with water, dries rapidly to a transparent, tenacious, flexible, water resistant adhesive film.

Improved Catalyst NP 743

Producers of methanol and ammonia have available an improved catalyst for the conversion of carbon monoxide to carbon dioxide and hydrogen. Enjay BR-769 Conversion Catalyst is marketed by the Enjay Co. and is an iron-chromium converter catalyst that has a side strength of 50 to 70 lbs. and a bulk density ranging from 80 to 100 lbs. Normally avail-

CHEMICAL INDUSTRIES TECHNICAL DATA SERVICE

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Please send me more information, if available, on the following items. I understand that nothing further may be available on some of them.

NP 737	NP 741	NP 745	NP 749	NP 753
NP 738	NP 742	NP 746	NP 750	NP 754
NP 739	NP 743	NP 747	NP 751	NP 755
NP 740	NP 744	NP 748	NP 752	

(Please print)

Name..... (Position).....

Company.....

Street.....

City..... Zone..... State.....



No Steaming Needed

—in spite of 21 days of rugged winter!

Columbia Caustic Soda Tank Car Unloaded Without Difficulty

On January 28, 1948, a Columbia Caustic Soda tank car left Barberton, Ohio, consigned to a Massachusetts plant. Heavy snow storms side-tracked the car near Buffalo. Transit time for this haul, ordinarily three to four days, stretched out to twenty-one days.

In spite of the long exposure to sub-zero weather, the temperature of the caustic liquor, loaded at 150°F., dropped only to 95°F. None of the liquor had solidified and the car was unloaded easily and completely, without steaming.

Delays of this duration are rare. The incident therefore provides unusual evidence of the highly efficient design and construction of these cars—particularly in respect to insulation—and the rigid inspection and attention given to loading temperatures.

The same care is used in the manufacture and shipping of all Columbia products. Pittsburgh Plate Glass Company, Columbia Chemical Division, Fifth Avenue at Bellefield, Pittsburgh 13, Pennsylvania.

COLUMBIA CHEMICALS

CHICAGO · NEW YORK · BOSTON · CINCINNATI · MINNEAPOLIS · CHARLOTTE · ST. LOUIS · CLEVELAND · PITTSBURGH · PHILADELPHIA · SAN FRANCISCO

PAINT · GLASS · CHEMICALS · BRUSHES · PLASTICS

PITTSBURGH PLATE GLASS COMPANY

AMMONIA

is many things to many chemists

AMMONIA is a well-known and widely-used industrial chemical. It is the leading refrigerant and the main source of nitrogen for fertilizers. Petroleum refiners use Ammonia to neutralize acid in oil.

Ammonia is oxidized to make nitric acid or to furnish nitrogen oxides for producing sulphuric acid by the chamber process. Ammonia extracts certain metals from ores. It is a solvent and reaction medium in organic synthesis.

Ammonia is a nutrient for yeast and a nitriding agent for alloy steels. Cracked into its gases, Ammonia is a protective atmosphere for bright annealing, powder metallurgy and brazing. Dissociated Ammonia also supplies hydrogen for welding and for producing metal powders.

Ammonia is a processing agent in the manufacture of alkalis, rayon, dyes, pharmaceuticals, butadiene, and catalysts for cracking petroleum. Ammonia is used with chlorine to purify water.

Ammonia has literally hundreds of industrial uses. For information, contact Barrett, America's leading distributor of Ammonia.

Barrett Standard Anhydrous Ammonia is shipped in cylinders and tank cars.

Is YOUR Industry listed among these users of Ammonia

• Alkalis • City Gas • Copper • Cyanides • Detergent • Dye and Intermediates • Explosive • Fertilizer • Fireproofing • Household Cleaners • Industrial Alcohol • Inorganic Chemicals • Insecticides • Magnesium • Medical Gas • Metallurgical • Mildew Proofing • Molybdenum • Nickel • Nitric Acid • Organic Chemicals • Paper • Petroleum • Pharmaceutical • Pigments • Plastics • Radio Parts and Tubes • Rayon • Refrigeration • • Rubber • • Sugar Refining • Sulphuric Acid • Textile • Yeast

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America's Leading Distributor of AMMONIA

able in ⅜" pellets, it can be obtained in pellet sizes ranging from 3/16" to ⅞".

m-Chlorobenzotrifluoride NP 744

This new chemical, of considerable interest in the preparation of dyestuff intermediates, is being produced in pilot plant quantities by the Hooker Electrochemical Co. It is a clear, colorless, aromatic liquid, characterized by the trifluoromethyl radical which is generally stable to heat, light and to chemical reaction. The product has a distillation range of 134.8° to 138.6° C, a freezing point of —56° C, and a Sp. G. of 1.446 at 15.5° C.

Paint Remover NP 745

By inhibiting evaporation the improved Kelite Products, Inc. paint lift penetrates paint more thoroughly and gets paint off faster. Extremely slow evaporation makes the new material especially effective for outdoor use. It is safe on metals, including aluminum, iron, tin, magnesium and contains no phenolic compounds.

Chlordane Insecticide NP 746

A powerful new non-staining insecticide that is 10 times more effective than DDT on a wide range of insects has been developed by the Processed Chemical and Coatings Corp. Called CD-68, the new chemical compound contains technical chlordane, described as an unsurpassed killer of roaches, clothes moths, moth larvae, mosquitos, flies, bedbugs, ants, ticks, and lice. The new insecticide is said to be less toxic to humans and warm-blooded animals than DDT.

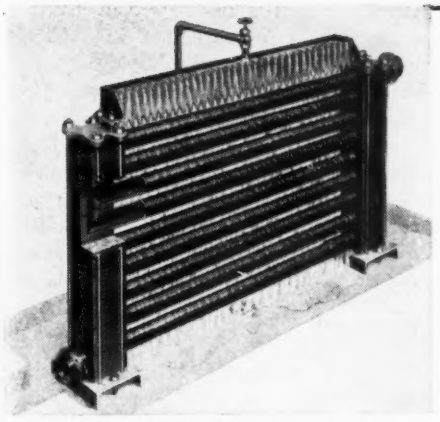
A spray application of CD-68 combines quick knockdown with killing power and will remain insecticidally potent for five weeks to two months after it is applied. Because the new insecticide is non-crystalline it leaves an invisible residue. The new compound has a pleasant pine-like odor.

Liquid Desizer NP 747

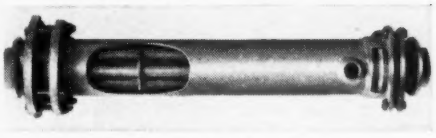
Rhozyme LA, the new liquid diastatic enzyme concentrate for textile desizing, of Rohm & Haas Co., combines the recognized economy of a liquid enzyme with unusual stability at high temperatures, affording thorough, rapid and uniform desizing.

Wire Rope Compound NP 748

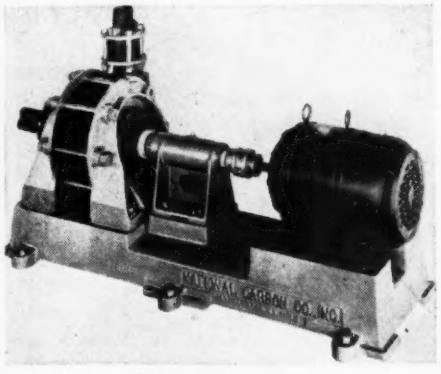
A new compound for protecting wire rope and cable against deterioration caused by weathering, exposure to salt spray, corrosive fumes and vapors, or produced by mechanical strains and tensions, developed by the White Oil & Petrolatum Div., L. Sonneborn Sons, Inc. extends the serviceability of rope or cable by preventing rusting and by lubricating the wire



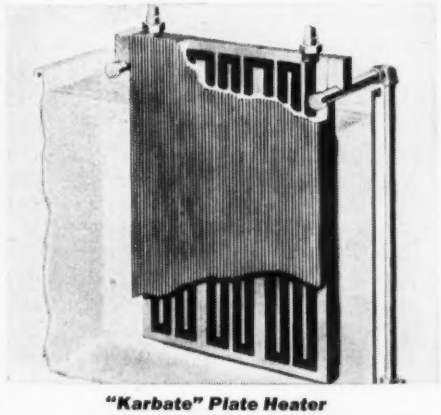
"Karbate" Sectional Cascade Cooler



"Karbate" Series 70 Heat Exchanger



"Karbate" Pump



"Karbate" Plate Heater



Carbon Brick for Tank Lining

How to lick corrosion if you pickle or plate metal . . .

USE NATIONAL CARBON PRODUCTS

FOR HEATING, cooling, pumping, and conveying the corrosive solutions used in pickling and plating metal, there's no better equipment than that made of "Karbate" brand Impervious Graphite. This material is chemically inert, immune to thermal shock, easy to machine and install, light in weight yet strong; and has a very high heat-transfer rate.

Operating experience has proved that "Karbate" equipment stands up in sulphuric, hydrochloric, and nitric-hydrofluoric pickling solutions . . . Parkerizing and Bonderizing baths . . . nickel, copper, tin, and zinc plating solutions . . . electro-polishing and Alumilite and Alzak processes.

"National" carbon brick is now extensively used for lining tanks that handle corrosive solutions – particularly nitric-hydrofluoric.

For more details on metal-cleaning systems of standard "Karbate" brand Impervious Graphite units and "National" carbon brick, write to National Carbon Company, Inc., Dept. CI.

These products sold in Canada by Canadian National Carbon Company Limited, Toronto 4

The registered trade-marks "Karbate" and "National" distinguish products of

NATIONAL CARBON COMPANY, INC.

Unit of Union Carbide and Carbon Corporation

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30 East 42nd St., New York 17, N. Y.

Division Sales Offices:
Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco



WE'VE DONE IT FOR CLEANERS . . .

. . . for those who dry clean your clothes, renovate your draperies or scour and mothproof your rugs. Seldom, today, are these things returned from the better cleaning establishments, reeking, as formerly, of the solvents, naphthas and various kerosene derivatives used in dry cleaning formulas. The simple explanation for this is that inexpensive, yet effective, deodorizing compounds have been developed to overcome the obnoxious odors of these constituents. Now, when your properly treated garment, rug or slip-cover is returned to you, it should not only look clean . . . it should *smell* clean!

PERHAPS WE CAN DO IT FOR YOU! . . .

Our technical staff has made important contributions to the variety and efficiency of the odor neutralizing materials now available for the cleaning industry. It has developed equally efficient deodorants for other fields—plastic, textile, rubber, oil, paint, glue, to mention but a few. It is prepared, further, to work on *your* industrial odor problem if you have one, whether it involve the creation of a selling fragrance for your finished product or the development of an odorant designed merely to "cover" an objectionable processing odor in your plant or a bad residual odor in your product. Just tell us what your problem is and we'll gladly work with you toward a practical and economical solution.

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Brothers, Inc.

PORT AUTHORITY BUILDING, 76 NINTH AVENUE, NEW YORK 11, N. Y.

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FACTORY: *Clifton, N. J.*

strands to reduce the effects of internal stress and strain. Described as a blend of high-melting petroleum lubricants, anti-corrosion agents and finely dispersed pigments of high tinctorial strength, the new compound possesses great durability, high elasticity and positive adhesion. It withstands high temperatures and internal movement in the rope or cable will not displace the compound. The compound can be supplied in any color desired.

Quick Setting Glue NP 749

A new, quick setting, room temperature urea resin adhesive for the woodworking industry that sets in 10 min. has been developed by the Timber Engineering Co. Known as Colpres 10, the research was undertaken by the hardwood industry's Committee on Research Administration, an activity of the National Lumber Mfrs. Assn.

The adhesive sets at room temperature (75° F.) and the setting time is so responsive to temperature changes that the speed of cure can be easily adjusted to production line requirements. The glue is water resistant, non-staining and consists of a dry powder formaldehyde resin which is mixed with water and applied to one of the wood surfaces to be glued, and a liquid hardener which is applied to the other surface. By pre-heating the wood to which the resin is applied to 180° F, a clamping time of 2 min. may be used. Shear strength developed is approximately 500 psi. Ultimate strength is reached in about 24 hours at which time shear strengths approaching 4,000 psi. are not uncommon, using dense hardwoods. Tests on two year old shear blocks show no deterioration with age.

Hydrogenated Rotenone NP 750

The Whitmire Research Laboratories have hydrogenated rotenone by a patented process to stabilize its killing and lasting power when exposed to light, heat, air, or impurities found in water and inert dust bases. Rotenone has been worked up into residual sprays with this hydrogenerated material as a base.

High-Viscosity Alkyd Resin NP 751

Aroplaz 1081-M is a new high-viscosity, pure, oxidizing, medium oil-length alkyd supplied at 50% solids in mineral spirits by U. S. Industrial Chemicals, Inc.

The increasing consumer resistance to higher-priced merchandise has resulted in pressure on the paint manufacturer to produce quality finishes at lower prices. This makes the introduction of Aroplaz 1081-M timely from an economical standpoint due to its very high viscosity which means that quality goods can be

CELANESE* ACETIC ACID

$$CH_3-\overset{\overset{O}{\|}}{C}-OH$$

Celanese* Glacial Acetic Acid, with a purity greater than 99.5%, is now being made available to a much greater portion of American industry. The high quality of this chemical makes it ideally suited for applications in pharmaceuticals, textile treatment and in organic syntheses. This versatile acid is also used in the production of acetate esters for the varnish and lacquer industries.

Water Content	0.5% by weight, maximum
Freezing Point	15.6° C., minimum
Specific Gravity	1.050 to 1.055 @ 20/20° C.
Color	Water White
Formic Acid Content	0.2% by weight, maximum
Non-Volatile Matter	0.001% by weight, maximum
Iron Content	1.0 PPM by weight, maximum

A new brochure is available containing specifications and general information on many of the Celanese* Organic Chemicals. Write for your copy—and call Celanese whenever you need technical assistance regarding organics.

CELANESE CORPORATION OF AMERICA
Chemical Division
180 Madison Avenue, New York 16, N.Y.

CELANESE* FORMALDEHYDE

Formaldehyde, one of the most important products in the growing family of Celanese Organic Chemicals, is now offered in greater volume. This high quality, U.S.P. chemical is sold commercially as Formalin, a water white solution containing 40% formaldehyde by volume, 37% by weight. It is obtainable in both methanol inhibited and uninhibited grades.



Celanese* Chemicals

*Reg. U. S. Pat. Off.

ALCOHOLS • ALDEHYDES • GLYCOLS • KETONES • ACIDS • SOLVENTS • PLASTICIZERS • INTERMEDIATES

Newark TESTING SIEVES

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STRONG DURABLE CLOTH

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If raw material control, laboratory testing or product control in your plant calls for accurate sieve testing, Newark's Standard Testing Sieves have a definite place in your plant. Made to conform with the latest specification of the National Bureau of Standards and the American Society for Testing Materials, these sieves are extremely accurate, and, as with testing instruments of all types, accuracy is of first importance. Newark Sieves are accurate because among other things the mesh is exact and there are no crevices to catch particles.

Newark Standard Testing Sieves are available in a complete range of sizes and we shall be glad to recommend the best range of meshes for your particular requirements.



NEWARK for ACCURACY

Newark Wire Cloth COMPANY

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prepared at standard package consistency with much lower than usual vehicle solids content. Generally speaking, satisfactory enamel package consistency can be maintained with vehicle solids ranging from 33% to 36%. In addition, Aroplaz 1081-M has a singular advantage over present mineral spirits alkyd solutions on the market in that it is compatible in all ratios with most melamine and urea resins.

Polyester-Impregnated Decorative Material NP 753

United States Rubber Co. is now producing in quantity a new type of decorative material, suitable for both horizontal and vertical surfaces.

An outgrowth of large-scale war production, combining fabrics and plastics, the material, known as Satusply, is now being produced in 34 different colors and patterns, with gloss or satin finish. A cigarette-proof type is available in all colors, designs and finishes. It is made in continuous rolls and in several widths and thicknesses.

In producing Satusply, paper or cloth is completely impregnated and surfaced with polyester thermosetting resin, then processed under heat and tension.

The protective coating formed by the resin makes the non-porous plastic material washable, highly resistant to stains, acids, alkalies and wear.

The company is also producing a special cement, called Satusply-Sement, to bond the material satisfactorily to the base surface. For some uses, it is preapplied to the back of the sheets at the factory, ready for installation in the field. It is also furnished in containers for application on the job.

Gluing Process NP 754

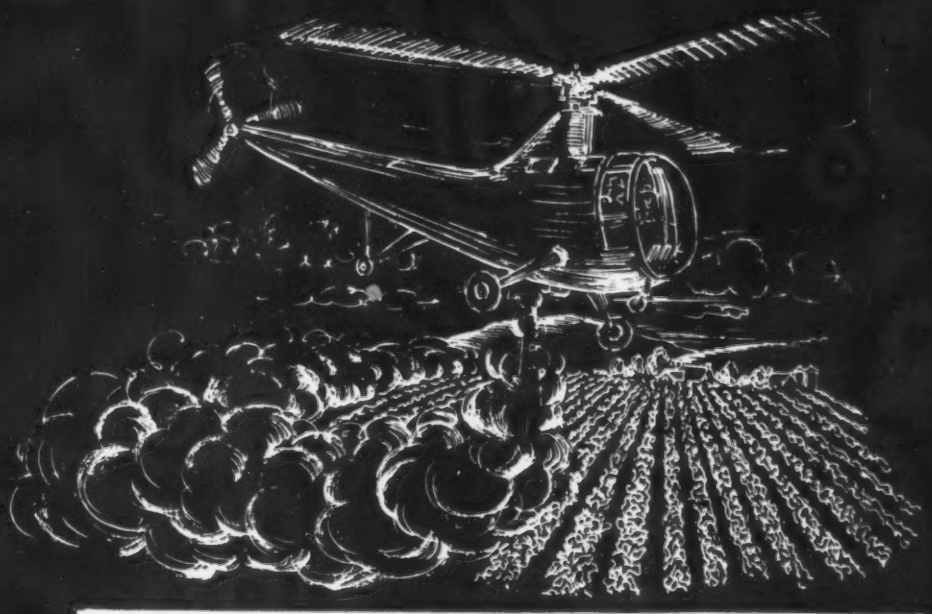
The new no-clamp process of the Monsanto Chemical Co. results in flatter panels, easier handling and stronger bonds. The most important improvement over the cold-press method is in labor saving. By eliminating clamping and unclamping there is a marked increase in output. Standard adhesives are used with a cold press capable of applying 75 psi.

Color Buffing Composition NP 755

The Hanson-Van Winkle-Munning Co. has developed a new bar composition for color buffing carbon steel, stainless steel and chromium plate. It has a binder that retains the abrasive on the buff face for a greater period of time, permitting it to do its cutting and not building up a heavy waxy face that prevents a high color free from casts. The composition produces a high finish and at the same time cuts out imperfections left from the cutting down operations. It also will color burn chrome.

STAUFFER CHEMICALS

FOR AGRICULTURE



Stauffer offers a comprehensive line of agricultural insecticides, fungicides, spraying oils, stock dips and soil conditioners from plants and warehouse stocks in every agricultural section of the country. Stauffer manufactures a type of sulphur to meet every control condition in which sulphur is used. Stauffer also offers a line of insecticides such as DDT, BHC, Toxaphene and others, blended with inert carriers or combined with sulphur for either spraying or dusting.

STAUFFER PRODUCTS

BHC—Benzene Hexachloride
Boric Acid—Borax
Carbon Bisulphide
Carbon Tetrachloride
Caustic Soda
Chlorine
Citric Acid
Cream of Tartar
Silicon Tetrachloride
Sodium Hydrosulphide
Stripper, Textile
DDT—Dichloro-Diphenyl-Trichloroethane
Sulphur
Sulphuric Acid
Sulphur Chloride
Tartaric Acid
Titanium Trichloride
Toxaphene-Chlorinated Camphene

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STAUFFER

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(*Continued from page 418*)

ish-red crystalline mass. Deliquescent. Soluble in water and alcohol. Boiling in water converts it to the basic chromate. Also soluble in ammonium hydroxide. City Chemical Corp.

COPPER 3-PHENYLSALICYLATE

A gray-green to brown colored crystalline material having only a very slight odor. It is a thermostable textile preservative which can be applied to cellulosic fabrics from solvent solution, from emulsions or in a two bath treatment. It is highly effective against mildew and rotting organisms and causes no tendering of weather exposed fabric. The material also shows promise of being a satisfactory preservative for leather. Available in semi-commercial quantities. Dow Chemical Co.

COPPER CAPRYLATE

18%Cu, a bluish powder insoluble in water and alcohol but soluble in organic solvents. Used in the manufacture of solutions, lotions, creams and powders for the treatment of fungous infections, such as athlete's foot and ringworm of the scalp. Commercially available. Chemo Puro Mfg. Corp.

COPPER UNDECYLENATE

Cu = 14½%. A bluish powder insoluble in water and alcohol, but soluble in organic solvents. White powder insol. in water or alcohol. Use: In the treatment of fungous infections of the skin. Availability: In commercial quantities. Chemo Puro Mfg. Corp.

CROTONIC ACID

M.W., 86.088; M.P., 72°C.; B.P., 185°C. White crystalline solid. Chemical properties: the double bond adds halogens, halogen acids and hypohalous acids; eracts with cellulosic derivatives to form water impermeable films with good dimensional stability Suggested uses: intermediate in the preparation of surface coatings, plasticizers, and pharmaceuticals; as a modifier of drying oils. Its esters are of interest in the preparation of polymers and copolymers. Available in semi-commercial quantities. Carbide and Carbon Chemicals Corp.

CROTONIC ANHYDRIDE

M.W., 154.16; B.P., 112°C. (10 mm.); water-white liquid @ 20°C. Chemical properties: undergoes many of the reactions of crotonic acid such as addition of halogens, halogen acids and hypohalous acids, formation of esters of interest as polymers and copolymers, and reaction with cellulosic derivatives to give water permeable films with good dimensional stability; permits esterification of hydroxyl-containing compounds with greater ease than in the case of crotonic acid. Suggested uses: intermediate in the preparation of surface coatings, plasticizers, copolymers, and pharmaceuticals; modifier for drying oils. Available in semi-commercial quantities. Carbide and Carbon Chemicals Corp.

CUMENE HYDROPEROXIDE

A pale yellow to colorless liquid which contains 69-75% of a, a-dimethyl benzyl hydroperoxide. The other components are a, a-dimethyl benzyl alcohol and acetophenone. Slightly soluble in water, but readily soluble in organic solvents such as alcohol, acetone, esters, hydrocarbons, and chlorinated hydrocarbons. It is a reasonably stable hydroperoxide, an effective catalyst for free radical reactions such as polymerization, and forms a crystalline sodium salt in strong (25 per cent) sodium hydroxide solutions. Uses: In a "redox system" with a reducing sugar and iron pyrophosphates, it is an extremely effective emulsion polymerization catalyst; other indicated uses are in rubber reclaiming or flotation, and as a vulcanization accelerator. Hercules Powder Co.

CUPRIC COBALTICYANIDE

$Cu_3[Co(CN)_6]_2$. M.W., 620.81; blue powder; insoluble in water and dilute nitric acid. Soluble in ammonium hydroxide. City Chemical Corp.

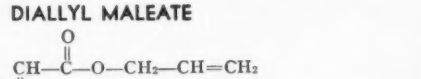
n-DECYL ALDEHYDE

$C_{10}H_{20}O$. M.W., 158.16; B.P., 75-79° C./4 mm.; Density, 0.83 @ 15° C.; Soluble in alcohol, ether; insoluble in water; colorless liquid. Chemical properties; Reacts as a normal aldehyde. Suggested uses: Organic synthesis; perfumes. Availability: Research quantities. Genesee Research Corp.

DI-ALLYL-ISO-PHTHALATE

$C_{14}H_{14}O_4$. M.W., 246; B.P., 152-153/1 mm.; Density, 1.114 @ 20° C.; R.I., 1.5248 @ 20° C.; Insoluble in water, slightly soluble in alcohol; soluble in benzene; colorless liquid; colors on standing and heating. Chemical properties: Undergoes reaction of the ester group but will also give standard tests for unsaturated linkage because of the allyl groups. Suggested uses: Plasticizer; perfume; resin solvent; high vacuum work. Availability: Research quantities. Genesee Research Corp.

DIALLYL MALEATE



M.W., 196.2; B.P., 97° C. (1 mm.). Supplied as an 85% solution in toluene with average wt. 8.71 lb. per gal. and Fl. P. 115° F. Chemical properties: An ester having three vinyl groups; polymerizes readily upon heating. Uses: Of particular interest to the plastics industry for surface coating, casting resin, copolymer, and cross-linking applications such as in the preparation of modified alkyd resins. Available in commercial quantities. Carbide and Carbon Chemicals Corp.

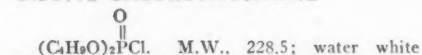
DIBROMODICHLOROMETHANE

CBr_2Cl_2. M.W., 242.8; B.P., 133° C.; Sp. G., 25/25° C., 2.40; n_D^{25}, 1.550. Clear, colorless liquid with sweet odor. Non-inflammable, mobile, soluble in most organic solvents. Uses: Organic synthesis. Availability: Experimental. Michigan Chemical Corp.

1,4-DIBROMOPENTANE

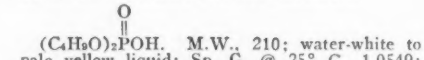
$CH_2BrCH_2CH_2CHBrCH_3$. M.W., 229.91; Sp. G., 1.680 @ 20/4° C.; B.P., 99-101°/20 mm. Water white liquid which may darken on standing. Chemical properties: An interesting intermediate for synthesis in that one of its halogens is normal and the other secondary. One or both halogens may be replaced; Uses: synthesis of pharmaceuticals and other organic chemicals. Availability: Laboratory scale. Columbia Organic Chemicals Co.

DIBUTYL CHLOROPHOSPHATE



M.W., 228.5; water white liquid; B.P., 103-106° C. @ 1.5 mm.; R.I., 1.4289; Sp. G. @ 25° C., 1.0742. Soluble in common inert organic solvents. Hydrolyzes very slowly in water at room temperature. The active chlorine atom is capable of reacting with alcohol and glycols to form neutral phosphorus-containing esters. Suggested use: Intermediate for organic synthesis. Availability: Semi-commercial quantities. Victor Chemical Works.

DIBUTYL HYDROGEN PHOSPHATE



M.W., 210; water-white to pale yellow liquid; Sp. G. @ 25° C., 1.0549; R.I., 1.4260; viscosity @ 25° C., 56 centipoises. Approximately 97-98% pure containing no monobutyl dihydrogen phosphate. Strong monobasic acid capable of forming various salts. Soluble in common organic solvents, very slightly soluble in water. Suggested uses: Acid catalyst for phenol formaldehyde and urea formaldehyde types of resins, intermediate for preparing salts, intermediate for organic synthesis. Availability: Semi-commercial quantities. Victor Chemical Works.

Di-*n*-BUTYL-ISO-PHTHALATE

$C_{16}H_{22}O_4$. M.W., 278; B.P., 191-193/3 mm.; Density, 1.045 @ 20° C.; R.I., 1.4938 @ 20° C.; insoluble in water; soluble in benzene; slightly soluble in alcohol; colorless liquid; colors on strong heating. Chemical properties: Undergoes typical ester reactions, although sluggishly. Suggested uses: Plasticizer; perfume; resin solvent; high vacuum work. Availability: Research quantities. Genesee Research Corp.

DIBUTYL ITACONATE

$C_{13}H_{22}O_4$. Colorless liquid; M.W., 242.31; B.P., 245° C. @ 10 mm.; Sp. G., 0.9833 @ 24° C.; R.I., 1.4416 @ 25° C.; acidity 0.01%; very slightly soluble in water. Active terminal unsaturation. Polymerizes to a viscous liquid. Usual unsaturated ester reactions. Suggested uses: Polymerization, chemical intermediate. Available in pilot plant quantities. Chas. Pfizer & Co.

4,4-DICARBOXY DIPHENYL ETHER

$C_{14}H_{10}O_5$. M.W., 258; M.P., 321-323° C.; insoluble in water and alcohol; soluble (slightly) in ether; White powder; stable. Chemical properties: Undergoes standard reactions of carboxyl group. Suggested uses: Plastics, organic synthesis. Availability: Research quantities. Genesee Research Corp.

1,3-DICHLOROPROPENE

$CHCl=CH-CH_2Cl$. M.W., 110.98; B.P., cis 104.1° C.; trans 112.1° C.; Sp. $G._{4°}^{20°}$ C., cis 1.225, trans 1.225; R.I., $n_D^{—}$, cis 1.469, trans 1.475; flash point, Tag open cup, 95° F.; solubility, water <0.1% w., acetone miscible, toluene miscible,octane miscible. Readily undergoes metathesis reactions involving the allylic chlorine and addition reactions to the double bond. By reactions of either or both of these functional groups, many interesting derivatives may be obtained. Available in trial-lot quantities (semi-commercial). Shell Chemical Corp.

DIETHYL CHLOROPHOSPHATE

$(C_2H_5O)_2POCl$. M.W., 172; water-white liquid; B.P., 60° C. @ 2 mm; R.I., 1.4153; Sp. G., 1.1915 @ 25° C. Soluble in common inert organic solvents, hydrolyzes in water. The active chlorine atom is capable of reacting with alcohols and glycols to form neutral phosphorous-containing esters. Suggested uses: Intermediate for organic synthesis. Availability: Semi-commercial quantities. Victor Chemical Works.

DICHLOROPHTHALIC ANHYDRIDE

$C_6H_2Cl_2(CO)_2O$. M.W., 217.0; practically white flakes consisting of a mixture of isomers; B.P., about 220°C. (40 mm.); M.P. range, 80-140°C. Suggested for use in preparation of alkyd resins, plasticizers and other modified phthalate derivatives. Availability: Semi-commercial quantities. Monsanto Chemical Co.

2,5-DICHLOROTHIOPHENE

C_4SH_2Cl. M.W., 153.05; Sp. G., $20/20°_{19}$ C., 1.449; B.P., 160° C.; $n_D^{—}$, 1.5608; color, water white; odor, like chlorobenzenes. Useful in pharmaceuticals, dyes, perfumes, economic poisons and other organic syntheses. Available in commercial quantities. Michigan Chemical Corp.

DIETHYLENE GLYCOL DIBENZENESULFONATE

$C_6H_5SO_2OC_2H_4OC_2H_4OSO_2C_6H_5$. M.W., 386.4; sol. in water, 0.03% @ 27° C. Liquid or partially solidified at room temp.; sol. in benzene, propylene dichloride, ethyl alcohol and ethyl acetate; color, yellow. Chemical properties: Stable to hydrolysis under ordinary conditions but can be hydrolyzed by caustic. Suggested uses: Plasticizer, softener and curing accelerator. Available in semi-commercial quantities. Wyandotte Chemicals Corp.

DI(2-ETHYL HEXYL)-ISO-PHTHALATE

$C_{24}H_{38}O_4$. M.W., 390; B.P., 224-226° C./3 mm.; Density, 0.98 @ 20° C.; R.I., 1.4859 @ 20° C.; insoluble in water; very slightly soluble in alcohol; soluble in benzene; light yellow liquid; colors on strong heating. Chemical properties: Undergoes typical ester reactions, although somewhat sluggishly. Suggested uses: Plasticizer; perfume; resin solvent; high vacuum work. Availability: Research quantities. Genesee Research Corp.

DIETHYL ITACONATE

$C_9H_{14}O_4$. M.W., 186.12. Colorless liquid, B.P., 123° C. @ 10 mm.; Sp. G., 1.036 @ 22° C.; R.I., 1.4405 @ 22° C.; acidity 0.01%; slightly soluble in water. Active terminal unsaturation, polymerizable to a brittle resin and other usual unsaturated ester reactions. Suggested uses: Copolymerization systems, chemical intermediate. Available in pilot plant quantities. Chas. Pfizer & Co.

DIETHYL MALEATE

$C_2H_5OOCHC{:}CHCOOC_2H_5$. M.W., 172.2. Tentative specifications: ester value, 99-100%; specific gravity, 1.0653-1.0660 @ 25° C./25° C.; acidity, not more than 0.015% by weight, calculated as maleic acid; water, not more than 0.5% by weight; color, 10APHA maximum; boiling range, not less than 90% distilling in a 3° range including 129° C. at 40 mm.; melting point, -10° C. to -12° C. Chemical properties: Since diethyl maleate is an unsaturated compound as well as an ester, frequent reactions typical of both groupings occur. Thus with ammonia, diethyl maleate forms the ester of aspartic acid, but it also forms the diamide of maleic acid and more complex compounds. Compounds such as polyhydric alcohols react with both the double bond and the ester groups of diethyl maleate to form polymers. The reactions of maleic acid and its derivatives may suggest applications warranting the inves-

tigation of diethyl maleate as a raw material for synthesis. Availability: Commercially available. Commercial Solvents Corp.

DIETHYL-*p*-NITROPHENYL THIONOPHOSPHATE

(Parathion)—"Genithion" $(C_2H_5O)_2(p\text{-}NO_2\text{-}C_6H_4O)PS$. A dark reddish oily liquid used in the formulation of spray powder or dust base insecticides for the control of a variety of insect pests. Available in experimental quantities. Allied Chemical and Dye Corp., General Chemical Division.

DIGLYCOLIC ACID

$O(CH_2COOH)_2$. M.W., 134.09; white crystalline solid; M.P., 148° C.; sol. water, lower alcohols, acetone, dioxane; insol. ethers, esters, hydrocarbons. Uses: mfr. plasticizers, intermediates. E. I. du Pont de Nemours & Co.

N,N-DIHYDROXYETHYL ETHYLENE DIAMINE

(Hydroxyethyl aminoethyl ethanolamine) White crystaline solid melting at 99°C. Suggested uses: glue plasticizers; alkyd resin modifier; intermediate for surface-active compounds. Available in commercial quantities. Carbide and Carbon Chemicals Corp.

5,7-DIHYDROXY-4-METHYL COUMARIN

$C_{10}H_8O_4 \cdot H_2O$. M.W., 210 (monohydrate); yellow free-flowing material; M.P., 280-286° C.; soluble in alcohol and aqueous alcoholic solutions, sodium carbonate, and sodium hydroxide solution; insoluble in ether, benzene, and water. Fluorescent—absorbs ultraviolet light. Suggested uses: Cosmetics, as sun screens; soaps, as whitening agents; plastics; dye intermediate; pharmaceutical. Availability: Research quantities. Edwal Laboratories, Inc.

dl-B-(3,4-DIHYDROXYPHENYL) ALANINE

A dihydroxy amino acid of interest for reagent use and experimental work. Available in experimental quantities. Dow Chemical Co.

DIISOBUTYL CARBINOL

$$(CH_3)_2CHCH_2CHCH_2CH(CH_3)_2$$
$$\quad\quad\quad

2-ETHYLHEXYL ACRYLATE

$CH_2{=}CHCOOCH_2CH(CH_2CH_3)CH_2CH_2CH_3$. Mol. wt. 184. B.P. at 60 mm. 125°C. Acid no. 0.2. Purity (by sap. no.) 99%. This monomer gives soft, tacky polymers and copolymers which may be of particular interest for adhesives. Its use in copolymers for "internal plasticization" is also indicated. Available in pilot plant quantities. Rohm & Haas Co.

ETHYL METHACRYLATE

$CH_2{=}C(CH_3)CO_2C_2H_5$. M.W., 114; B.P., 118.5° C.; Sp. G., 0911/25° C.; flash point, 20° C. Principal uses: Polymerization. Rohm & Haas Co.

FERRIC THIOCYANATE

$Fe(CNS)_3{\cdot}3H_2O$. M.W., 284.09; reddish-black deliquescent crystalline masses. Decomposed by heating. Soluble in water, alcohol and ether giving red solutions. City Chemical Corp.

GRIGNARD REAGENTS (MISCELLANEOUS)

RMgX. A variety of alkyl Grignard reagents are available in ethyl or n-butyl ether solutions, and in strengths ranging from 1 to 4 molar. These highly reactive materials are of use in the synthesis of a vast number of organic compounds of both theoretical and commercial interest. Availability: EtMgCl, MeMgBr, MeMgCl, PhMgBr, and EtMgBr are presently produced in research, pilot and commercial (drum lot) quantities. Five others in research quantities presently. Almost any compound of this family, for which the halide is available, can be produced on order. Arapahoe Chemicals, Inc.

HEPTANOIC ACID

$CH_3(CH_2)_5COOH$. M.W., 130.18; B.P., @ 9 mm., 128° C.; Sp. G., @ 20° C., .915; Neut. Value, 425. A colorless, mobile liquid. Of use in the preparation of heptyl compounds. Available in experimental quantities. Baker Castor Oil Co.

HEPTANOL-3

Sp. G., 0.8224 @ 20/20° C.; B.P., 156.2° C. (760 mm.); V.P., 0.58 mm. Hg @ 20° C.; sol. in water, slight; wt. per gal., 6.84 lb. @ 20° C. Uses: For the manufacture of lacquer solvents, plasticizers, oil additives, and mineral flotation reagents. Suggested as anti-foam agent. Available in commercial quantities. Carbide and Carbon Chemicals Corp.

n-HEXYL AMINE

Sp.G., 0.7670 @20/20°C.; boiling range, 126 to 131°C. (760 mm.). Suggested uses: intermediate for the manufacture of rubber chemicals, pharmaceuticals, and dyestuffs where increased oil solubility is desired. Available in semi-commercial quantities. Carbide and Carbon Chemicals Corp.

n-HEXYL "CELLOSOLVE"*

$CH_3(CH_2)_5OC_2H_4OH$. Ethylene Glycol Monohexyl Ether. M.W., 146.22; Sp. G., 0.8894 @ 20/20° C.; B.P. 208.3° C. (760 mm.); F.P., -45.1° C.; V.P., 0.1 mm. Hg @ 20° C.; Fl. P (open cup), 195° F.; solubility in water, 0.99% by wt. @ 20° C.; sol. of water in, 18.78% by wt. @ 20° C.; color, water-white; odor, mild. Chemical properties: high-boiling liquid of low volatility; can be esterified. Uses: Coupling agent for soluble oils, dry-cleaning soaps, insecticide sprays, and cutting oils; solvent in the formulation of slow-drying inks and brushing lacquers. Its esters, such as the phthalate, should be valuable low-volatility plasticizers for synthetic resins. Available in pilot scale quantities. Carbide and Carbon Chemicals Corp.

*Trade Mark.

n-HEXYL CYANIDE

Heptanenitrile, $C_6H_{13}CN$. M.W., 111.19; Sp. G., @ 20°/4° C. .8153; B.P., 184-186°; B.P., 74-76°/16 mm.; R.I., 1.41037 @ 30° C. Very slightly soluble in water, completely soluble in ethanol, ether, benzene, etc. Chemical properties: characteristic of an alkyl cyanide. Suggested use: Research intermediate in organic syntheses and as component in insect repellents, lubricating and softening agents, plasticizer and extender in synthetic rubbers and plastics. Columbia Organic Chemicals Co.

n-HEXYL-*p*-TOLUENESULFONATE

$C_7H_7SO_3C_6H_{13}$. M.W., 256.35; Sp. G., 1.064 @ 25°C./25°C.; B.P. 155°C. (1 mm); sol. in water: 0.01 g per 100 g water; sol. in VM&P naphtha, benzene, propylene dichloride, ethanol, ethyl acetate. Color: yellow. Chemical properties: stable to hydrolysis under ordinary conditions but may be hydrolyzed by caustic. Suggested uses: Alkylating agent, plasticizer and curing accelerator. Availability: Semi-commercial quantities. Wyandotte Chemicals Corp.

N-HYDROXYETHYL PROPYLENE DIAMINE

Sp.G., 0.9912 @ 20/20°C., boiling range, 230 to 242°C. (760 mm.); liquid @ 20°C. Reacts easily with fatty acids to give oil-soluble cationic emulsifiers useful for soluble oils, emulsions, ore flotation, and textile finishing. Approximately 50-50 mixture of α- and β-substituted compounds. Available in commercial quantities. Carbide and Carbon Chemicals Corp.

HYDROXYHEPTYL PEROXIDE

$[CH_3(CH_2)_5CH(OH)]_2O_2$. M.W., 262.38; purity, 95% minimum; active oxygen, 5.8% minimum; M.P., 60°-65° C. Fine white powder, moderately soluble in organic solvents and polyester monomers, insoluble in water. Useful as a polymerization catalyst for polyester resins at room or low temperatures, particularly for casting operations. Available in pilot plant quantities. Lucidol Div., Novadel-Agene Corp.

HYDROXYSTEARIC ACID, M-358--R

$C_{17}H_{34}(OH)COOH$. 12-hydroxy octadecanoic acid. M.W., 300 (approx.), flake, M.P., 75° C.; "inner ester" 1%; unsaponifiable ½%; odorless, white, sol. in most organic solvents, insol. in water. Chemical properties: Undergoes usual fatty acid reactions, presence of hydroxyl group permits reactions at 12 carbon position. Derivatives exhibit unusual solubility and compatibility characteristics. Suggested uses: As soaps in greases to give excellent "working" character and high melting points; in carbon and waxed paper to increase hardness and melting point; as base for cosmetic and plasticizer derivatives. Availability: Limited commercial quantities. Emery Industries, Inc.

beta-IODONAPHTHALENE

$C_{10}H_7I$. M.W., 254.08; M.P., 54-55° C.; B.P., 308-310° C.; insoluble in water; very soluble in alcohol; very soluble in ether; pink crystals; darkens on heating or long exposure. Chemical properties: Standard reactions dependent upon the iodo group. Suggested uses: Organic synthesis. Availability: Research quantities. Genesee Research Corp.

IONOL* (2,6-DITERTIARY BUTYL-*p*-CRESOL)

M.W., 220.34; M.P., 70.0° C.; B.P., 265° C. (760 mm.); Sp. G., 1.048 @ 20°/4° C.; pale yellow granular solid; sol. in ethanol 26% @ 20° C., insol. in water. Non-staining and non-discoloring anti-oxidant for natural and synthetic rubbers, retards checking under natural weathering conditions. Commercially available. Shell Chemical Corp.

*Trade-mark Registered—U.S. Patent Office.

ISOBUTYL ACRYLATE

$CH_2{=}CHCOOCH_2CH(CH_3)_2$. Mol. wt. 128. B.P. at 760 mm. 135-140°C. Flash point (open cup) 107°F. Sp. gr. at 25°/4°C. 0.883. Purity (by sap. no.) 99%. Polymer of isobutyl acrylate has brittle point of —24°C. which is comparable to that of polyethyl acrylate and considerably higher than the brittle point of *n*-butyl acrylate polymer. Thus, use of isobutyl acrylate gives a polymer or copolymer (e.g., with styrene) with solubility comparable to a butyl acrylate polymer or copolymer but softness comparable to an ethyl acrylate polymer. Available in pilot plant quantities. Rohm & Haas Co.

LAURYL METHACRYLATE

$CH_2{=}C(CH_3)CO_2CH_2(CH_2)_nCH_3$. Made from mixture of normal alcohols containing about 65% C_{12}, 25% C_{14}, 10% C_{16}. Boiling range 80% between 193-243° C./50 mm. Light yellow liquid. Sp. G., 0.863/26° C. Principal uses: Polymerization, chemical intermediate. Rohm & Haas Co.

LEAD CYANATE

$Pb(CNO)_2$. M.W., 291.3; white powder; insoluble in water. Decomposed by heating. City Chemical Corp.

LEAD IODATE

$Pb(IO_3)_2$. M.W., 557.1; white powder, decomposed by heating at 300° C. Insoluble in water and ammonium hydroxide, slightly soluble in dilute nitric acid. City Chemical Corp.

LEAD TETRA-ACETATE

$Pb(C_2H_3O_2)_4$. M.W., 443.39; white to pink crystals wet with 10-15% of glacial acetic acid. Widely used for splitting glycols to produce two molecules of aldehyde; various 1,2-diamino and 1,2-aminohydroxy compounds behave similarly. In addition to this well-known reaction, lead tetra-acetate oxidizes a wide variety of other compounds in specific ways. Available in limited commercial quantities. Arapahoe Chemicals, Inc.

MANGANESE PHOSPHATE (DIBASIC)

$MnHPO_4{\cdot}3H_2O$. M.W., 205.0; pink powder, very slightly soluble in dilute mineral acids. Suggested use: Medicine; reagent. City Chemical Corp.

MAGNESIUM FUMARATE

$MgC_4H_2O_4{\cdot}4H_2O$. M.W., 212. Mg = 11.5%; Fumaric Acid = 55%. White, odorless, stable granular powder, slightly soluble in water, insoluble in alcohol. Use: Because of the laxative effect of the fumarate ion, which is comparable to that of the tartrates without the latter's potential hazards, magnesium fumarate is suggested as an efficient cathartic. Availability: In commercial quantities. Chemo Puro Mfg. Corp.

2-MERCAPTO-4,6,6-TRIMETHYLTHIAZINE

$C_7H_{11}NS_2$. M.W., 173; Sp. G., 1.19; M.P., 92-94° C.; soluble in sodium hydroxide solution, insoluble in water, solubility in acetone @ 15° C., 27%; appearance, yellow crystals. Chemical properties: Forms a disulfide on oxidation, heavy metal salts, sulfonamides and monosulfides. Undergoes typical mercaptan reactions. Suggested use: As an organic intermediate. Availability: Pilot plant quantities. B. F. Goodrich Chemical Co.

METHACRYLIC ACID

$CH_2{:}C(CH_3)COOH$. (Alpha Methyl Acrylic Acid). M.W., 86.08; B.P., 162° C. (1 atm.); M.P., 16° C.; Sp. G., 1.0153 (20° C); sol. alcohol, ether, common organic solvents, alkali solutions; moderately sol. hot water. Sold as crude monomer, containing about 85% acid. Dark, opaque, thick liquid. Uses: Plastics manufacture, co-monomer in mfr. synthetic elastomers. E. I. du Pont de Nemours & Co.

METHACRYLIC ACID (40% aqueous solution)

$CH_2{=}C(CH_3)COOH$. Mol. wt. 86. Purity better than 96%. Polymer content less than 0.1%. M.P. (anhydrous) 15°C. B.P. (40% aqueous solution) 76-78°C. at 24-25 mm. B.P. (anhydrous) at 760 mm. 161°C. Polymers are water- and alkali-soluble, and copolymers are usually alkali-soluble. Double bond undergoes typical addition reactions. Available in commercial quantities. Rohm & Haas Co.

METHYL ACRYLATE

$CH_2{=}CHCO_2CH_3$. M.W., 86; B.P., 80° C.; Sp. G., 0.952/25°C.; flash point -3° C.; sol. in water 5.2% by wt. Principal uses: Preparation of polymers, intermediate for the preparation of pharmaceuticals. Rohm & Haas Co.

N-METHYLCYCLOHEXYLAMINO N-METHYLCYCLOHEXYL DITHIOCARBAMATE

$CH_3(C_6H_{11})N.CS.SH.HN(C_6H_{11})CH_3$. M.W., 302; 120-123°C.; Sp.G., 1.115; color, pale straw crystals; sol. in water, 2.2% @ 25°C., very sol. in acetone, methyl-, ethyl-, isopropyl alcohol, ethyl acetate, benzene, chloroform, and carbon tetrachloride, slightly sol. in ether; insol. or very slightly sol. in heptane. Suggested uses: vulcanization accelerator for rubber and rubber latex. Availability: Pilot plant quantities. Monsanto Chemical Co.

MOLYBDENUM SESQUIOXIDE, HYDRATE

$Mo_2O_3{\cdot}3H_2O$. M.W., 293.95; black powder, insoluble in water, acids, alkalies and ammonium hydroxide. City Chemical Corp.

alpha-NAPHTHOIC ACID

$C_{11}H_8O_2$. M.W., 172.17; M.P., 159-160° C.; very slightly soluble in hot water; very soluble in hot alcohol; soluble in ether; white powder. Chemical properties: Undergoes normal carboxylic acid reactions. Suggested uses: Organic synthesis. Availability: Research quantities. Genesee Research Corp.

beta-NAPHTHOIC ACID

$C_{11}H_8O_2$. M.W., 172.17; M.P., 164-165° C.; very soluble in alcohol; very slightly soluble in water; very soluble in ether; white powder. Chemical properties: Undergoes normal carboxylic acid reactions. Suggested uses: Or-

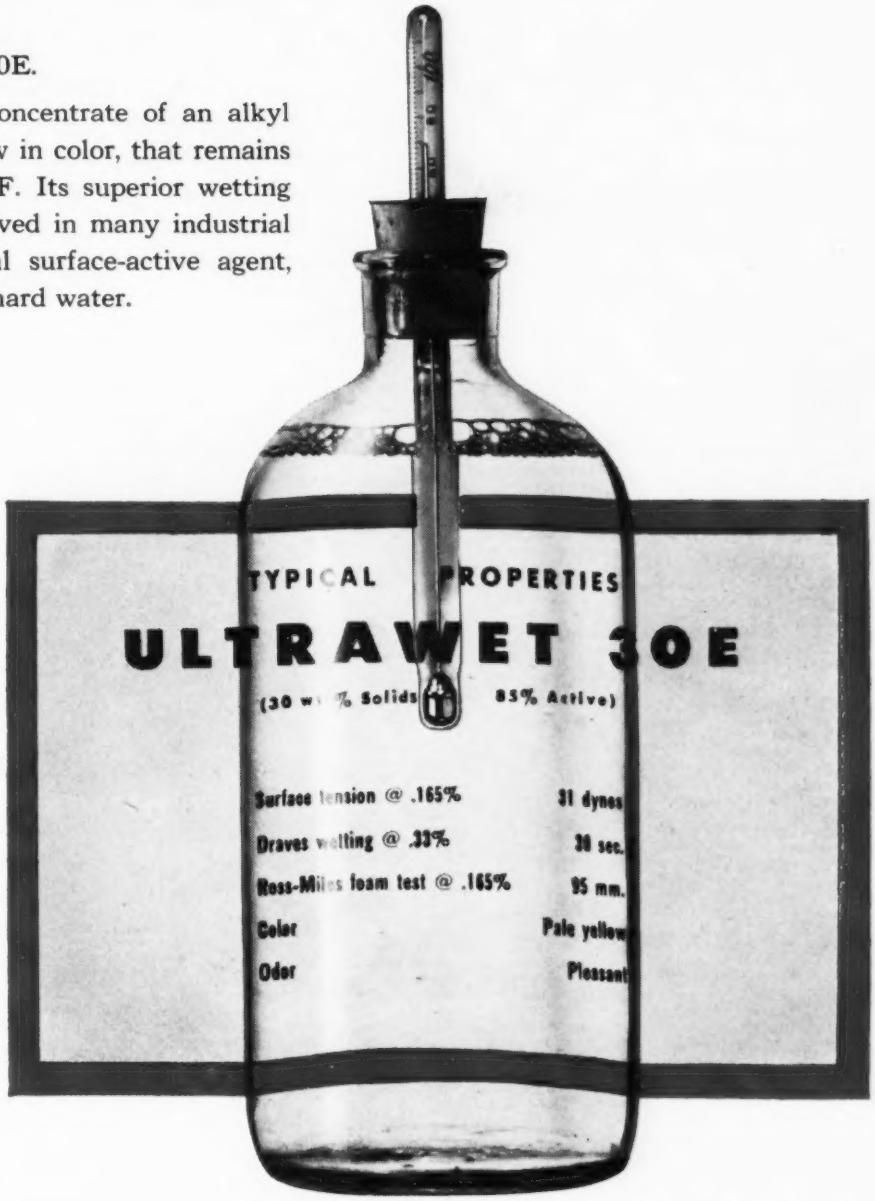
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ganic synthesis. Availability: Research quantities. Genesee Research Corp.

alpha-NAPHTHONITRILE

$C_{11}H_7N$. M.W., 153.17; M.P., 31-32° C.; B.P., 130-131° C./ 15 mm.; insoluble in water; soluble in alcohol; soluble in ether; light yellow needles; colors on strong heating. Chemical properties: Reacts normally in standard nitrile reactions. Suggested uses: Organic synthesis. Availability: Research quantities. Genesee Research Corp.

beta-NAPHTHONITRILE

$C_{11}H_7N$. M.W., 153.17; M.P., 65-66° C.; B.P., 134-135° C./15mm.; insoluble in water; soluble in ether, ligroin: white crystals; colors on heating or long standing in air. Chemical properties: Reaction normal in standard nitrile reactions. Suggested uses: Organic synthesis. Availability: Research quantities. Genesee Research Corp.

N-BUTYLACETANILIDE

$CH_3CON(C_4H_9)C_6H_5$. M.W., 191.27. Used in the manufacture of tick repellants. Available in experimental quantities. Dow Chemical Co.

N-ISOPROPYL BENZENESULFONAMIDE

$C_6H_5SO_2NHC_3H_7$. M.W., 199.26; Sp. G., 1.168 at 25°/25° C.; wt. per gal., approx. 9.75 lbs. at 25° C.; B.P., 203-204° C. (20 mm.); sol. in water, 0.42% at 27° C.; sol. in benzene, propylene dichloride, ethyl alcohol, ethyl acetate and ethylene glycol. Color: colorless liquid or partially solidified at room temp. Chemical properties: reacts with formaldehyde to produce condensation products useful as plasticizers and resins. Reacts with nitric acid to form the nitramid and is an intermediate for the preparation of N,N-di substituted benzenesulfonamides. Suggested uses: As a plasticizer for certain types of synthetic resins and as an intermediate. Availability: semi-commercial quantities. Wyandotte Chemicals Corp.

N,N-DIMETHYLCABAMYL CHLORIDE

$(CH_3)_2NCOCl$. M.W., 107.5; colorless liquid; strong smelling lachrymator; B.P., 167°C.; M.P., —33°C.; Sp.G. 20/4, 1.678; R.I. at 22°C., 1.45196; sol. in ether, carbon bisulfide, benzene. Suggested uses: As acylating agent in Friedel-Craft reactions involving acid chloride-type reactions and as esterifying agent to form carbamates and ureas. Availability: Laboratory quantities. Monsanto Chemical Co.

NITRIC OXIDE

NO. Sp. Gr. at —150.2°C. 1.27; M. P., —161.0°C.; B. P., —150.0°C.; critical temperature, —94.0°C.; critical pressure, 65.0 atm.; heat of vaporization @ 151.0°C., 74.9 cal/g. A colorless gas at standard conditions, and only slightly soluble in water; it reacts immediately upon contact with the oxygen of he air to form nitrogen dioxide; it reacts with chlorine and bromine to form the corresponding nitrosyl compounds. At present, the principal industrial application is in the production of nitric acid. For research and pilot plant studies. Matheson Co.

NONYL ACETATE

Diisobutyl Carbinyl Acetate Sp.G., 0.8530 @ 20/20°C.; B.P., 192.4°C. (760 mm.); F.P., —48.1°C.; R.I., 1.4152 @ 20°C.; viscosity, 1.71 cps. @ 20°C.; sol. in water, <0.02% by wt. @ 20°C.; sol. of water in, 0.27% by wt. @ 20°C. Chemical properties: forms a heterogeneous constant boiling mixture containing 32.6% nonyl acetate and 77.4% water, which boils at 97°C.; the mixture separates into 2 layers, the upper substantially nonyl acetate with a relative volume of 36.2% and the lower, water at volume 63.8%. Uses: extractant for anti-biotics; high-boiling solvent for nitrocellulose. Available in tank car quantities. Carbide and Carbon Chemicals Corp.

NONYL ALCOHOL

A mixture of approximately 75% primary trimethyl hexanols and 25% dimethyl heptanols. Boiling range (0—100%) 193°—206°C. or (5-95%) 196° — 201°C.; viscosity (centistokes) 8.0 at 130°F., and 633.4 at —40°F.; R. I., n_D^{20}, 1.4390; Sp. G. 15.6C/15.6°C., 0.845; color water white (30 Saybolt), solubility in water less than 0.05% volume at 25°C., miscible at room temperature with hexane. Chemical properties: Has the usual chemical properties of primary alcohols, and presents a raw material for synthetic organic products including esters, condensation products with ethylene oxide, nonanoic acid, etc. Its esters are effective plasticizers for a variety of synthetic resins. Available in experimental quantities. Standard Oil Co. of Ind.

n-NONYL MERCAPTAN

$C_9H_{19}SH$. M. W., 160.22; B. P., 219-221°C. 98-100°/15 mm; water white-liquid having pleasant odor which becomes sharp on standing. Insoluble in water, soluble in alcohol and ethers. Chemical properties: those of a typical mercaptan. Suggested uses: intermediate in organic synthesis. Availability: laboratory scale. Columbia Organic Chemicals Co.

NORMAL PARAFFINS

A highly refined product containing approximately 90% of normal paraffins, 2-3% aromatics, the balance naphthenes and isoparaffins. Available as a full-range material, C_{12}-C_{20}, or as fractions of 2-3 carbon atom groups such as C_{12}-C_{14}, C_{14}-C_{17}, C_{17}-C_{20}. Nearly colorless, and free of impurities such as olefins and sulfur compounds. Suggested as raw materials for the manufacture of surface active materials and chlorinated paraffins. Availability: Experimental quantities. Shell Chemical Corp.

n-OCTYL CYANIDE

Nonanenitrile, $C_8H_{17}CN$. M. W., 13.25; Sp. G. .8095 @ 30°/4°C. B. P., 105-107°/16 mm. R.I. 1.4214 @ 30°C. Suggested use: research intermediate, insect repellents, lubricating and softening agents, plasticizers and extenders for synthetic rubber and plastics. Columbia Organic Chemicals Co.

OCTYLPHENOXYDIETHOXYETHANOL

$C_8H_{17}C_6H_4(OC_2H_4)_2OC_2H_4OH$. Actually a mixture of similar alcohols in which this compound predominates. Sp. G., 1.025/25°C.; B. P., 190-225°/3 mm; Visc. at 100° F., 169.3 cs., at 210°F., 9.65 cs.; insol in water. Principal uses: Solvent, chemical intermediate. Rohm & Haas Co.

OCTYLPHENOXYTETRAPHEN-OXYETHANOL

$C_8H_{17}C_6H_4(OC_2H_4)_4OC_2H_4OH$. Actually a mixture of similar alcohols in which this compound predominates. Sp. G., 1.040/25°C.; B. P., 200-290°C./3 mm; visc. at 100° F., 113.9 cs., at 210° F. 10.07 cs.; insol. in water. Principal uses: Solvent, chemical intermediate. Rohm & Haas Co.

beta-PHENYLETHYLAMINE

$C_6H_5CH_2CH_2NH_2$. M.W., 121.2; colorless to slightly yellow liquid; B.P., about 200°C. (760 mm.); Sp.G., 0.96-0.97 at 15.5°/15.5°C. Chemical properties: Undergoes all the reactions characteristic of primary amines; may be used as a liquid or in the form of the acetate or hydrochloride in aqueous solution. Suggested uses: As an intermediate for chemical synthesis and a precursor in penicillin manufacture. Commercially available. Monsanto Chemical Co.

PHENYL ISOCYANATE

C_6H_5NCO (phenylcarbonimide). M. W., 119.12; Sp. G., 1.101 at 15.5°/15.5°C.; R. I., 1.535 at 20°C.; B. P., 162°C.; F. P., —33°C.; Flash P., 63°C. A pungent almost water white liquid. Suggested as a chemical intermediate in preparation of alkyd resins, textile finishing agents and in manufacture of a variety of other isocyanates, ureas, anilides, dianilides, urethanes, thiourethanes, carbamates and thiocarbamates. Availability: pilot plant quantities. Hooker Electrochemical Co.

PHENYL METHYL CARBINOL

$C_6H_5CH(CH_3)OH$. α-Methyl Benzyl Alcohol M. W., 122.16; Sp. G., 1.0150 @ 20/20°C.; B. P., 203.9°C. (760 mm.); F. P., 21.4°C.; R. I., 1.5211 @ 20°C.; V. P., 0.01 mm. Hg @ 20°C.; sol. in water, 2.3% by wt. @ 20°C.; sol. of water in, 5.9% by wt. @ 20°C.; heat of vaporization, 180 B.t.u. per lb. (760 mm.); coefficient of expansion, 0.00080 per °C. @ 20°C.; optical antipodes, *d*-form—α-D 42°88′, *l*-form —α-D 10°94′; color, water-white. Liquid @ 20°C. The commercial grade is a racemic mixture containing a small amount of acetophenone which imparts its characteristic odor. Chemical properties: undergoes most reactions typical of secondary alcohols; can be oxidized to acetophenone; can be esterified with difficulty by acid radical exchange with another ester; readily dehydrates with acids to yield styrene and di-α-methyl benzyl ether. Uses: high-boiling solvent for cellulose acetate-propionate, "Vinylite" resin AYAF, shellac, kauri gum, dewaxed dammar, ester gum "C", rosin, linseed oil, toluene, and "Troluoil"; softening agent for leathers. Its phenyl urethane finds use as a soporific, and its acetate as a perfume base for the gardenia odor. Available in experimental quantities. Carbide and Carbon Chemicals Corp.

3-PHENYLSALICYLIC ACID

$C_{13}H_{10}O3$ M. W., 214.2. A fine, light brown crystalline material with a melting point of approximately 187°C. Insoluble in water and VMP naphtha; slightly soluble in benzene and carbon tetrachloride; soluble in acetone, ether and methanol. Uses: chemical synthesis of medicinal compounds. Available in semi-commercial quantities. Dow Chemical Co.

PHLOROGLUCINOL

$C_6H_3(OH)_3$ M. W., 162.14 (dihydrate); M. R., 214-217°C. Sol. in water, 1% @ 25°C. Chemical properties: Couples with diazos to give colored compounds. The three hydroxy groups may enter into condensation reactions, the ring hydrogens may be substituted easily for alkyl, halogen, and other groups. Suggested uses: Acetate black dye coupling compound, component of metallizable wool dyes, resin component, preservative for cut flowers. Availability: Commercial quantities. Edwal Laboratories, Inc.

PIPERONYL BUTOXIDE

Technical grade of (butylcarbityl) (6-propyl piperonyl) ether, 80% purity. A light brown liquid of mild characteristic odor; soluble in alcohol, benzol, petroleum hydrocarbons, liquefied gases of the Freon type; Sp. G. at 25°C., 1.05 — 1.07; R. I. at 20°C., 1.497 — 1.512. Used as insecticide in combination with pyrethrins in oil solutions, emulsions, or powders. U. S. Industrial Chemicals, Inc.

PIPERONYL CYCLONENE

Technical grade of 3-isoamyl-5-(methylenedioxyphenyl)-2-cyclohexenone and its 6-carbethoxy derivative, 80% purity. Used as an insecticide in combination with rotenone, pyrethrins, or rotenone-pyrethrins mixtures in oil solutions, emulsions, or powders. U. S. Industrial Chemicals, Inc.

POLYETHYLENE GLYCOL CHLORIDES 410 and 610

M. W., 410 and 610 respectively. Chemical properties: the terminal chlorine atom permits the formation of ether, ester, and amine derivatives. Suggested uses: intermediate in the manufacture of detergents, dye leveling agents, and emulsifiers. Available in research quantities. Carbide and Carbon Chemicals Corp.

POLYGLYCOL P1000 PHENYL ETHER (B)

Average M. W., 1000. Polypropylene glycol derivative insoluble in water and exhibits a very low vapor pressure at ordinary temperatures. It is suggested for use as a solvent, a plasticizer and a chemical intermediate. Available in experimental quantities. Dow Chemical Co.

POLYGLYCOL P1200 METHYL ETHER (B)

Average M. W., 1200. Polypropylene glycol derivative. The solvent characteristics and low vapor pressures exhibited by this chemical suggest its use as a coupling agent, plasticizer and chemical intermediate. The small change in viscosity with change in temperature combined with the lubricating properties of this chemical suggest its use as an ingredient of brake fluids and other lubricating compositions. Available in experimental quantities. Dow Chemical Co.

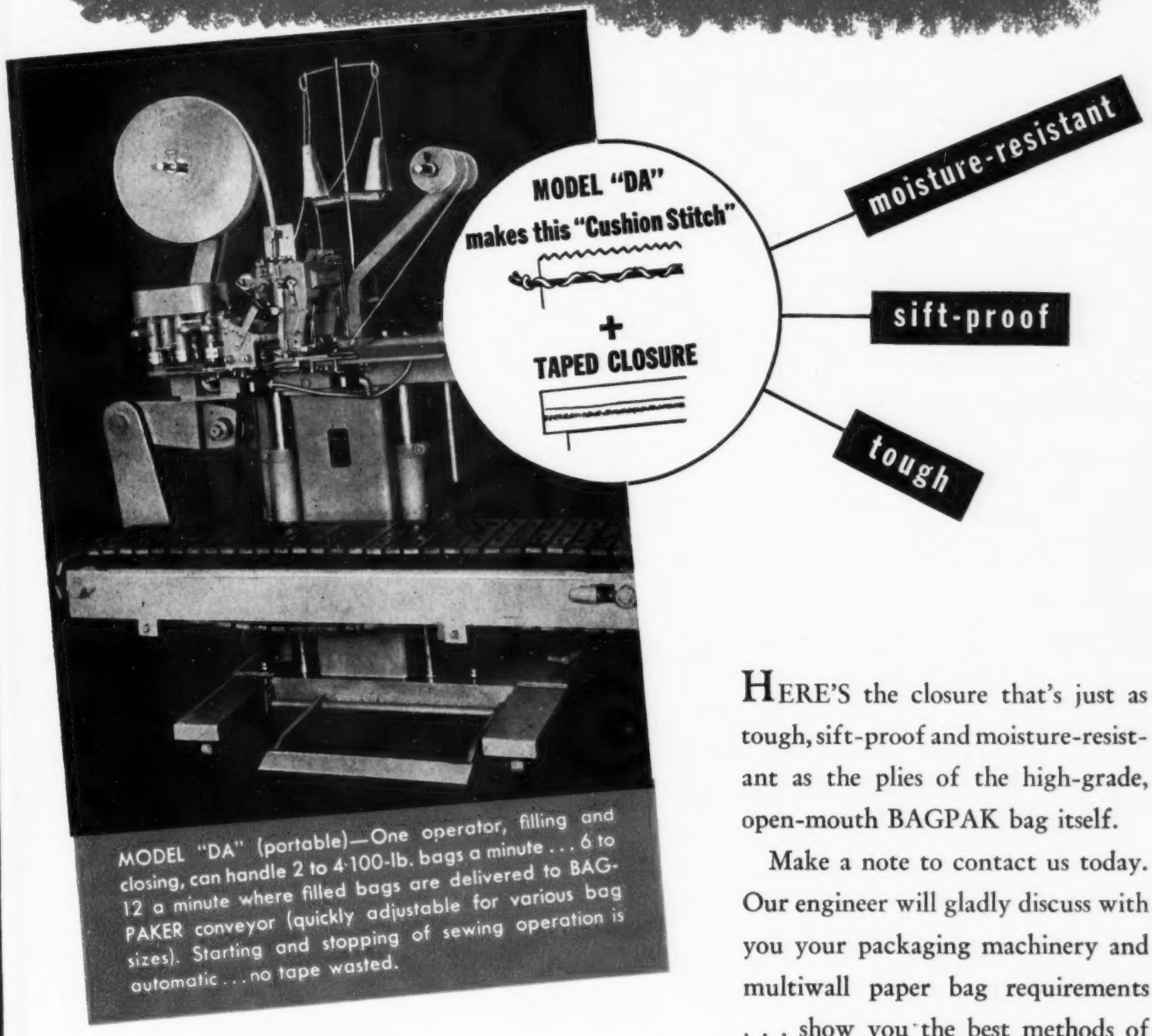
POLYGLYCOL P2000

Average M. W., 2000. Polypropylene glycol derivative. Sp. G. at 25/25°C., 1.001; pour point —33°C.; surface tension at 25°C., 33.12 dynes/cm.; viscosity at 25°C., 270.7 cps. Solubility at 25° C.: insoluble in water, completely miscible with acetone, benzene, carbon tetrachloride, ether, methanol, n-heptane, cyclohexane, ethanol and monochlorobenzene. Available in experimental quantities. Dow Chemical Co.

POLYOXYALKYLENE-2 DIBENZENESULFONATE

$C_6H_5SO_2(OC_2H_4)_xOSO_2C_6H_5$. Sp. G. 1.273 at 25°C./25°C.; sol. in water, 0.11 grams per 100 g water at 27°C.; sol. in benzene, propylene dichloride, ethanol, ethyl acetate; color: brown. Chemical properties: Stable to hydrolysis under ordinary conditions but can be hydrolyzed by caustic. Suggested uses: Plasticizer, softener and curing accelerator. Avail-

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IN CANADA: Continental Paper Products, Ltd., Montreal, Ottawa

ability: Semi-commercial quantities. Wyandotte Chemicals Corp.

POLYPROPYLENE GLYCOL 425

M. W., 425; F.P., sets to a glass below —60°C.; Sp. G., 1.0103 @ 20/20°C.; Fl.P. (open cup), 390°F.; viscosity, 30 centistokes @ 100°F.; sol. in water, complete @ 20°C. (gradually diminishes with increasing temperature); in benzene, complete above 24°C.; in heptane, complete @ 20°C.; color, pale yellow. High-boiling, viscous liquid @ 20°C. Chemical properties: two hydroxyl groups in the molecule make possible the formation of mono- an di- fatty acid esters having different characteristics from the comparable polyethylene glycol esters because of the side chain methyl group—notably increased oil solubility. Uses: intermediate in the preparation of emulsifiers, detergents, and coupling agents, as a humectant, plasticizer, and lubricant; as a heat transfer medium. Available in commercial quantities. Carbide and Carbon Chemicals Corp.

POLYPROPYLENE GLYCOL 1025

M. W., 1025; F.P., sets to a glass below —50°C.; Sp.G., 1.0072 @ 20/20°C.; Fl.P. (open cup), 440°F.; viscosity, 77.1 centistokes @ 100°F.; sol. in water, 1.5% by wt. @ 20°C.; in benzene, complete @ 20°C.; in heptane, complete @ 20°C. High-boiling, viscous liquid @ 20°C. Chemical properties: two hydroxyl groups in the molecule make possible the formation of mono- and di- fatty acid esters having different characteristics from the comparable polyethylene glycol esters because of the side chain methyl group—notably increased oil solubility. Uses: intermediate in the preparation of emulsifiers, detergents, and coupling agents; as a humectant, plasticizer, and lubricant; as a heat transfer medium. Available in commercial quantities. Carbide and Carbon Chemicals Corp.

POLYPROPYLENE GLYCOL 2025

M. W., 2025; F.P., sets to a glass below —45°C.; Sp.G., 1.0055 @ 20/20°C.; Fl.P. (open cup), 450°F.; viscosity, 169.8 centistokes @ 100°F.; sol. in water, 0.15% by wt. @ 20°C.; in benzene, complete @ 20°C.; in heptane, complete @ 20°C. High-boiling, viscous liquid @ 20°C. Chemical properties: two hydroxyl groups in the molecule make possible the formation of mono- and di- fatty acid esters having different characteristics from the comparable polyethylene glycol esters because of the side chain methyl group—notably increased oil solubility. Uses: intermediate in the preparation of emulsifiers, detergents, and coupling agents, as a humectant, plasticizer, and lubricant, as a heat transfer medium. Available in commercial quantities. Carbide and Carbon Chemicals Corp.

POTASSIUM FORMATE

$KCHO_2$. M. W., 84. A white, practically odorless, very slightly hygroscopic crystalline powder. Soluble in water, giving a practically neutral solution; insoluble in alcohol. Use: When properly compounded with other formates, chlorides and starch, potassium formate gives a sodium—free table salt which may be used by persons unable to take sodium chloride in their diet. Availability: In commercial quantities. Chemo Puro Mfg. Corp.

POTASSIUM HEXAFLUOROPHOSPHATE

KPF_6 M. W., 184.08; M. P., about 575°C with slow decomposition. Solubility: g. per 100 g. water, 5.5 at 0°C, 9.3 at 25° 20.6 at 50°, 57.0 at 95°. Solutions stable and neutral, no attack on glass. The PF_6 ion extremely stable in alkaline media, can be hydrolyzed by heating in acidic solution to give fluoride and orthophosphate. No marked toxicity shown by salt. Active metals liberate phosphorus from molten salt. Phosphorus pentafluoride obtainable by thermal decomposition or by reaction with sulfuric acid. Availability: experimental quantities. Ozark-Mahoning Co.

POTASSIUM LACTATE

$CH_3CHOHCOOK$. M. W., 128.16. 50% aqueous solution by wt. shows the following: Sp. G., 25°/4° = 1.2699; η = 54.92 millipoises @ 25°C.; N_D 25°C. = 1.4018; B.P. @ 742 mm = 109.35°C. F.P. = —51.0°C.; surface tension @ 29°C = 66.4 dynes/cm. Available in concentrations up to about 50% by weight. Suggested uses: Synthesis, freezing point depressant, glycerol substitute where a definite moisture relationship is desired. American Maize Products Co.

POTASSIUM MONOFLUOROPHOSPHATE

K_2PO_3F. M. W., 176.17, M. P., about 825°C; solubility in water, about 20 g. per 100 g. Solution is neutral, hydrolyzed to fluoride and phosphate by heating, acidic media favor hydrolysis, mildly alkaline solutions are stable. Molten salt slowly losses fluorine-containing vapors, cleans metal surfaces. Solutions have some fungicidal activity. Availability: experimental quantities. Ozark-Mahoning Co.

POTASSIUM PHENYLACETATE

A 64% aqueous solution; Sp.G., 1.26 at 25°/25°C.; R.I., 1.477 at 25°C. Suggested for use as a pencillin precursor and chemical intermediate. Commercially available. Monsanto Chemical Co.

POTASSIUM TRICHLOROACETATE

CCl_3COOK M. W., 201.5; white powder, soluble in water and alcohol. City Chemical Corp.

B-PROPIOLACTONE

$C_3H_4O_2$ M. W., 72.06; Sp. G., 20°/20°C., 1.1460; R.I., 1.4131 @ 20°C; B.P., 51°C @ 10 mm; sol. in water, 37% (by volume) @ 25°C; reacts with water; flash point (open cup), 74°C. Chemical properties: Four-membered lactone ring is opened with inorganic salts, organic salts, phenols, mercaptans, dithiocarbamates, xanthates, halogen acids, ammonia, amines, water, alcohols, acid chlorides and thioureas to form β-substituted derivatives of propionic acid. Suggested uses: Preparation of acrylic esters, acrylamides, acrylyl chloride and β-substituted propionic acids. Available in pilot plant quantities. B. F. Goodrich Chemical Co.

n-PROPYL BENZENESULFONATE

$C_6H_5SO_3C_3H_7$. M. W., 200.25; Sp. G., 1.173 at 25°C./25°C.; sol. in water, 0.04% at 27°C.; sol. in benzene, propylene dichloride, ethyl alcohol, ethyl acetate and ethylene glycol. Color, amber. Chemical properties: less stable than the corresponding carboxylic acid ester, can be hydrolyzed by caustic. Suggested uses: as a propylating agent and curing accelerator. Availability: Semi-commercial quantities. Wyandotte Chemicals Corp.

PROPYLENE GLYCOL, ISOPROPYL ETHER (DOWANOL 36A)

$C_6H_{14}O_2$. M. W., 118.2; Sp. G. @ 25/25°C., 0.878. B. P. @ 760 mm 144°C., @ 10 mm 36°C., viscosity @ 25°C. 2.27 cps.; R. I. @ 25°C., 1.407; fire point, 125°C. Solubility at 25°C.: completely miscible with acetone, benzene, carbon tetrachloride, ethanol, ether, methanol, monochlorobenzene, petroleum ether, VMP naphtha. A mixture of primary and secondary alcohols. The excellent solubility for organic compounds plus complete miscibility with water indicate the usefulness of this chemical in solvent applications. Organic derivatives may be prepared by reactions with the alcohol group. Available in semi-commercial quantities. Dow Chemical Co.

PROPYLENE GLYCOL METHYL ETHER ACETATE (DOWESTER A33B)

An active solvent for nitrocellulose and should find wide application as a lacquer solvent. The boiling point is 146°C. Available in semi-plant quantities. Dow Chemical Co.

PYRIDINIUM HEXAFLUOROPHOSPHATE

$C_5H_5NHPF_6$. M. W., 225.09, M. P., about 170°C. with decomposition; solubility: about 4 g per 100 g water; slightly soluble in lower alcohols, very soluble in acetone, insoluble in carbon tetrachloride and petroleum ether. Melting salt has some cleaning action on metal surfaces, liberates pyridine. Solution has pH about 3. Availability: experimental quantities. Ozark-Mahoning Co.

2-PYRIDONE

C_5H_5NO. M. W., 95.04; M. P., 106-107°C.; B. P., 280-281°C (norm. pressure). Yellow brown crystals. Very soluble: chloroform, alcohol, water. Rather soluble: ether, benzol. Insoluble: in ligroin. Use: Intermediate in pharmaceuticals, in organic synthesis (keto-enol tautomery). Commercially available. Fairmont Chemical Co.

SEMICARBAZIDE BASE

$NH_2NHCONH_2$. M. W., 75.07. M. P., 96°C. Crystals very soluble in water and alcohol, insoluble in ether, benzol and chloroform. Chemical property: forms with most oxo-compounds "semicarbazons," which are very well developed crystals of sharp melting points. Oxo-compounds can be recovered by strong acids. Use: Determination and isolation of oxo-compounds. Commercially available. Fairmont Chemical Co.

SALICYLAMIDE

A fine white crystalline material with a melting point of approximately 141°C. M. W., 137.1. Insoluble in water, VMP naphtha, and carbon tetrachloride; slightly soluble in benzene and ether; soluble in acetone and methanol of interest for the preparation of pharmaceuticals. Available in experimental quantities. Dow Chemical Co.

SODIUM ASCORBATE

$C_6H_7O_6Na$. M. W., 198 Na = 16%. White, odorless, stable powder, soluble in water, insoluble in alcohol. pH of aqueous solution 5.5 — 5.9. Use: This almost neutral sale of Vitamin C is better tolerated by many individuals than free ascorbic acid, and may be administered as tablets or by intramuscular or intravenous injection. Availability: In commercial quantities. Chemo Puro Mfg. Corp.

SODIUM CAPRYLATE

13½% Na, a white powder soluble in water, but insoluble in alcohol. Used in the manufacture of solutions, creams and powders for the treatment of fungous infections, such as athlete's foot and ring worm of the scalp. Commercially available. Chemo Puro Mfg. Co.

SODIUM COBALTICYANIDE

$Na_3Co(CN)_6$ M. W., 284.1; yellow crystals. Soluble in water. City Chemical Corp.

SODIUM COPPER POLYPHOSPHATE

Complex alkali-heavy-metal phosphate glass, sparingly soluble in water. Dense blue powder. Suggested use: Fungicide for preservation of seeds. Availability: Laboratory quantities. Monsanto Chemical Co.

SODIUM *p*-CYMENESULFONATE

$(CH_3)\bullet(C_6H_7)C_6H_3\bullet SO_3Na$. M. W., 236.26; sol. in water, 90.8 g. per 100 g. water at 25°C. White to cream colored powder; soluble in ethanol. Chemical Properties: Reacts with strong mineral acids to form the free *p*-cymenesulfonic acid. Suggested uses: As a hydrotrope for increasing the solubility of slightly soluble organic chemicals in aqueous solutions, in industries such as textiles, tanning, paper and electroplating. Availability: Semi-commercial quantities. Wyandotte Chemicals Corp.

SODIUM x-HYDROXY-x-PROPANESULFONATE

$C_3H_7O_4SNa$. M. W., 162. Of interest as an intermediate for the manufacture of detergents. In pilot plant production. Dow Chemical Co.

SODIUM LEAD POLYPHOSPHATE

Complex alkali-heavy-metal phosphate glass, sparingly soluble in water. White dense powder: Suggested use: A biocide. Availability: Laboratory quantities. Monsanto Chemical Co.

SODIUM MONOFLUOROPHOSPHATE

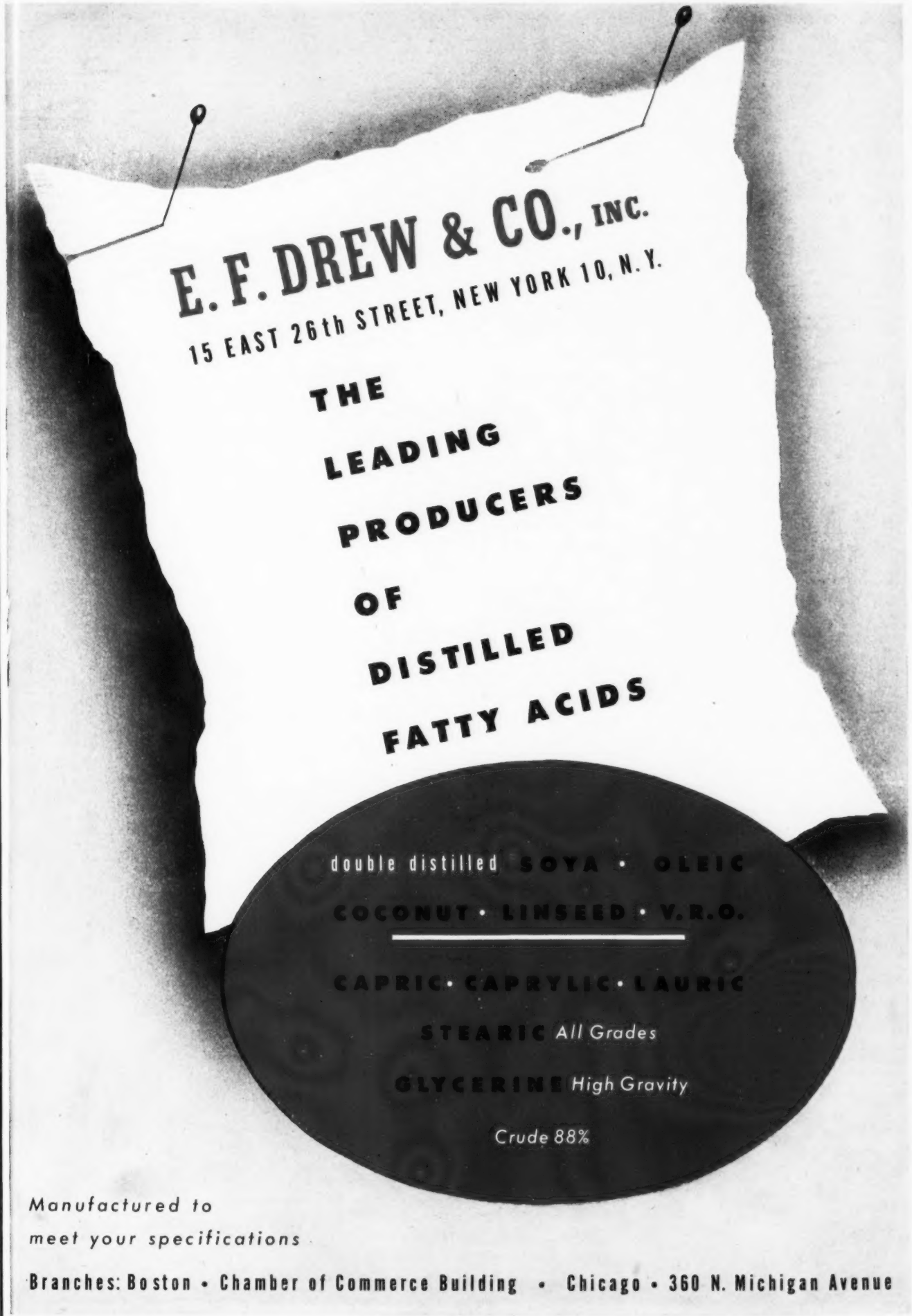
Na_2PO_3F. M. W., 143.97, M. P., 625°C.; about 25 g. soluble in 100 g. water at 25°C. Solution is neutral and stable unless heated. Heating of solution causes hydrolysis to fluoride and orthophosphate. Acidity favors hydrolysis, alkalinity does not. Fluorine-containing vapors lost slowly from molten salt. Molten salt wets and cleans metal surfaces. Solutions inhibit growth of some molds and bacteria. Availability: experimental quantities. Ozark-Mahoning Co.

SODIUM MONOFLUOROPHOSPHATE

Na_2PO_3F. White, crystalline powder; soluble in water; pH of a 1% solution, 8.4; Refractive Indices 1.445, 1.460, and 1.462 ± .002. Suggested uses: fluorinating agent, welding flux, lowering viscosity of melts. Availability: Research quantities. Victor Chemical Works.

SODIUM PARA AMINOBENZOATE

$C_7H_7O_2NNa \bullet \frac{1}{2}H_2O$ M. W., 167. Para-aminobenzoic acid = 80%, moisture = 5%, white or slightly yellowish, odorless powder. Soluble in water, slightly soluble in alcohol. Use: An effective agent for the early treatment of ricketsial diseases, such as typhus (louse — borne, scrub, and endemic) and Rocky Mountain Spotted Fever. Availability: In commercial quantities. Chemo Puro Mfg. Corp.


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SODIUM PHOSPHO ALUMINATE

Chemical analysis—water insoluble 0.1%; Na_2O 44.5%; Al_2O_3 43.5%; P_2O5 8.5%; SiO_2 1.5%; CO_2 1.5%; undetermined 0.4%. A white powder readily soluble in water, an alkaline source of alumina, and, hence, the opposite of the common acid source of alumina, aluminum sulfate. The reaction with aluminum sulfate induces co-precipitation of aluminum hydroxide and aluminum phosphate and, thus, any amount of these end-products can be introduced over a wide range of alkalinity or acidity. Packaged in 100 lb. bags. American Cyanamid Co.

SODIUM TOLUENESULFONATE

$CH_3C_6H_4SO_3Na$. M. W., 194.18; sol. in water, 84.0 grams per 100 grams of water at 26°C; white to cream colored powder. Soluble in ethanol. Chemical properties: Reacts with strong mineral acids to form the free toluenesulfonic acid. Suggested uses: As a hydrotrope for increasing the solubility of slightly soluble organic chemicals in aqueous solutions, in industries such as textile, tanning, paper and electroplating. Availability: Semicommercial quantities. Wyandotte Chemicals Corp.

SODIUM TRICHLOROACETATE

CCl_3COONa. M. W., 185.4; white crystals, soluble in water and alcohol. City Chemical Corp.

SODIUM UNDECYLENATE

Na=11%. A white granular powder soluble in water, but insoluble in alcohol. Use: In the treatment of fungus infections of the skin. Availability: In commercial quantities. Chemo Puro Mfg. Co.

STEARATO CHROMIC CHLORIDE

$C_{18}H_{35}Cr_2O_3Cl_4$ A Werner type chromium compound consisting of a concentrated solution of stearato chromic chloride in isopropanol. Readily soluble in water forming clear green solutions. Chromium nucleus combines chemically with cellulosic materials and is strongly absorbed by siliceous materials, polyamides and other negatively charged surfaces. Suggested use: as a water repellant treatment for paper, wood, and textiles; for the insolubilization of starches and proteins; as a pretreatment to improve bonding of wax coatings; and as an after-treatment of coated papers for insolubilizing coatings and imparting water repellancy. E. I. du Pont de Nemours and Co.

TETRAETHYL DITHIONOPYROPHOSPHATE

$(C_2H_5O)_2P(S)\text{-}O\text{-}P(S)(OC_2H_5)_2$. M. W., 322; white to yellow liquid, with characteristic odor; Sp. G. at 25°C., 1.185; R. I. 1.4753; B. P., 110-113°C. at 0.2 mm; viscosity at 25°C., 6 centipoises; approximately 90-95% pure; toxicity to white mice, MLD50, 8 mg/kg. Soluble in alcohols, ethers, esters, ketones, carbon tetrachloride, aromatic hydrocarbons, kerosene, heptanes, naphtha, and certain spray oils; solubility in water, approximately 25 mg/liter. Stable to hydrolysis at normal temperature even in the presence of a neutral emulsifier. Suggested uses: persistent, non-permanent insecticide for mites, aphids, and thrips. Availability: Pilot plant quantities. Victor Chemical Works.

TETRAETHYL PYROPHOSPHATE (TECHNICAL)

A liquid mixture of neutral ethyl esters of several polyphosphoric acids, containing approximately 40% tetraethyl pyrophosphate. Sp. G., 1.20; R. I., 1.420; cannot be distilled at 1 mm. pressure without decomposition; thermally stable at temperatures up to 150°C., decomposition rate becomes rapid at about 200°C. It is miscible in all proportions with water and all organic solvents except aliphatic hydrocarbons; hydrolysis occurs in water solution at a rate similar to that of hexaethyl tetraphosphate, the ultimate products being mono-, di-, and triethyl orthophosphate. A similar, but slower reaction occurs with alcohols. Preliminary tests indicate a toxicity of about 2.0 mg/kg at MLD50, against mice. Suggested uses: as an effective insecticide toward aphids and mites, and as a rodenticide. Availability: Commercial quantities. Victor Chemical Works.

TETRAHYDROPHTHALIC ANHYDRIDE

$C_8H_8(CO)_2O$. M. W., 152.1; M. P. 101°C.; white crystalline solid @ 20°C. Chemical properties: forms esters and certain types of adducts to the double bond; the double bond is more active than those in phthalic anhydride. Uses: intermediate for the manufacture of alkyd resins for varnishes and plastics; also of interest as a pharmaceutical and dyestuff intermediate. Available in experimental quantities. Carbide and Carbon Chemicals Corp.

TETRAMETHYLOLCYCLOHEXANOL (T. M. C.)

A white, crystalline powder; melting range 129-131°C.; hydroxyl content (percent OH) 34-44%. Functionality: five hydroxyl groups. Combining or equivalent weight: 50.0. Neutral, non-hygroscopic. All OH groups available for esterification. Very soluble in water, methanol, ethanol; insoluble in oils and fats, acetone, benzene. Enters readily into esterification reactions in presence of small quantities of lead stearate as catalyst; proceeds to low acid number. Catalyst does not affect color of reaction mixture, and product is light in color. Catalyst settles out and may be removed by filtration at end of esterification. Drying oils made with T.M.C. have quick set and have considerable hardness. Suggested uses: production of synthetic drying oils which dry to great hardness, production of varnishes from rosin esters of T.M.C., production of maleic acid alkyds. Availability: small quantities for experimental investigation on a cooperative basis. General Mills, Inc.

2-THIOPHENEALDEHYDE

$C_4H_3S\bullet CHO$. M.W., 112.14; Sp. G. 1.211 @ 20°/4° C.; R.I., 1.590 @ 20° C.; B.P., 92.5° @ 22 mm; colorless liquid of characteristic odor similar to benzaldehyde. Chemical properties are those expected of an aromatic aldehyde. Suggested uses: synthesis of derivatives of thiophene which should be of interest in the pharmaceutical and dye industries. Available in research quantities. Arapahoe Chemicals, Inc.

THIOSEMICARBAZIDE

$NH_2\text{-}CS\text{-}NH\text{-}NH_2$. A white crystalline powder, sol. in water or alcohol; M.P., 182-184° C. Use: Reagent for detecting metals. Fine Organics, Inc.

m-TOLUAMIDE

C_8H_9ON. M.W., 135.16; M.P. 94-95°C.; soluble in alcohol; slightly soluble in ether; slightly soluble in water; white needles. Chemical properties: Typical reactions of amides. Suggested uses: Organic synthesis. Availability: Research quantities. Genesee Research Corp.

o-TOLUAMIDE

C_8H_9ON. M.W., 135.16; M.P., 139-140°G; very soluble in hot water; very soluble in alcohol, ether; slightly soluble in cold water; white needles. Chemical properties: Typical reactions of amides. Suggested uses: Organic synthesis. Availability: Research quantities. Genesee Research Corp.

p-TOLUAMIDE

C_8H_9ON. M.W., 135.16; M.P., 159-160°C.; very soluble in hot water, alcohol, ether, slightly soluble in cold water; white needles. Chemical properties: Typical reactions of amides. Suggested uses: Organic synthesis. Availability: Research quantities. Genesee Research Corp.

TRICHLOROACETIC ACID

Cl_3CCOOH M.W., 163.40; M.P., 57.5°C.; B.P., 197.5°C.; sol. in water 120g./100 ml. @ 25°C.; ionization constant 2×10^{-1} @ 25°C; odor, sweet, ester-like; color, white crystalline; hygroscopic. Suggested use: as an ingredient in various pharmaceutical products; as an ingredient in general purpose herbicides. Available in semi-commercial quantities. Allied Chemical and Dye Corp., General Chemical Division.

2,4,5-TRICHLOROPHENOXYACETIC ACID

$C_6H_2Cl_3O\ CH_2CO_2H$. M.W., 255.5; light tan solid; M.P., 151°—153°C.; insol. in water, sol. in alcohol; readily forms sodium and alkanol amine salts. Used as the above salts or in the form of an ester. A hormone type compound having high plant toxocity. Suggested use: as herbicide for control of woody vegetation. Available in commercial quantities. Monsanto Chemical Co.

1,2,3-TRICHLOROPROPANE

$CH_2Cl\text{-}CHCl\text{-}CH_2Cl$. M.W., 147.44; Sp. G., 20°/4° C., 1.3888; R. I. n^{20}_D, 1.4841; B. P., 156.17°C.; solubility in water, 0.2-0.3% w. at 20°C.; flash point, tag open cup, 174°F.; Kauri-butanol Value, 89. Possesses solvent properties for oils, fats, waxes, chlorinated rubbers, and many natural and synthetic resins. Suggested in applications as paint and varnish removers and in degreasing operations. Its low vapor pressure at normal temperatures and non-flammable nature suggest its use where more volatile solvents are undesirable. Available in commercial quantities. Shell Chemical Corp.

TRIMETHYLNONYL ALCOHOL

$(CH_3)_2CHCH_2CHOHCH_2CH(CH_3)CH_2CH(CH_3)_2$. M.W., 186.33; Sp.G., 0.8193 @ 20/20°C.; B.P., 225.2°C. (760 mm.); F.P., sets to a glass at —60°C.; V.P., <0.01 mm. Hg @ 20°C.; Fl.P. (open cup), 200°F.; sol. in water <0.02% by wt. @ 20°C.; sol. of water in, 0.6% by wt. @ 20°C.; color, water-white; odor, mild. Uses: foam breaker in aqueous systems; intermediate in the manufacture of effective non-ionic detergent and surface active agent compositions, and special purpose solvents and plasticizers. Available in commercial quantities. Carbide and Carbon Chemicals Corp.

TRIHEXYL CITRATE

A light-colored ester of n-hexyl alcohol and citric acid, having a low vapor pressure. Extremely low solubility in water. M.W., 444.6; assay, over 99%; Sp.G. (@ 25°C.), 0.985; R.I. @ 24°C., 1.4478; heat test (1 hr. @ 150°C.) satisfactory; acidity, 0.006%; B.P., over 200°C. @ 1 mm. Suggested use: Vinyl plasticizer. Available in pilot plant quantities. Chas. Pfizer & Co.

2,6,8-TRIMETHYLNONANONE-4

$(CH_3)_2CHCH_2COCH_2CH(CH_3)CH_2CH(CH_3)_2$ M.W., 184.19; Sp.G., 0.8165 @ 20/20°C.; R.I., 1.4273 @ 20°C.; viscosity, 1.91 cps. @ 20°C.; boiling range, 211 to 219°C. (760 mm.); odor, fruity and pleasant. A vinyl resin dispersant and wetting agent, as an intermediate in ketone reactions, and for direct use in essential oil blends. As a dispersant in vinyl resin organosols it improves fusion and decreases the cracking tendency and allows higher solids content in hard coatings containing little or no plasticizer and permits blending of organosols with plastisols. Simplifies grinding procedures and yields products of low viscosity and excellent viscosity stability. Available in commercial quantities. Carbide and Carbon Chemicals Corp.

1,1,1-TRIMETHYLOL ETHANE

$CH_3C(CH_2OH)_3$; M.W., 116.15; M.P., 196°-200°C.; white powder; sol. in water, ethyl alcohol, acetone; insol. in benzene, toluene, petroleum ether. Chemical properties: the three primary alcoholic groups undergo the usual alcohol reactions, such as esterification, etc. Suggested uses: in resins, coating compositions, plasticizers, explosives, etc. Available in experimental quantities Heyden Chemical Corp.

TRIOCTYL CITRATE

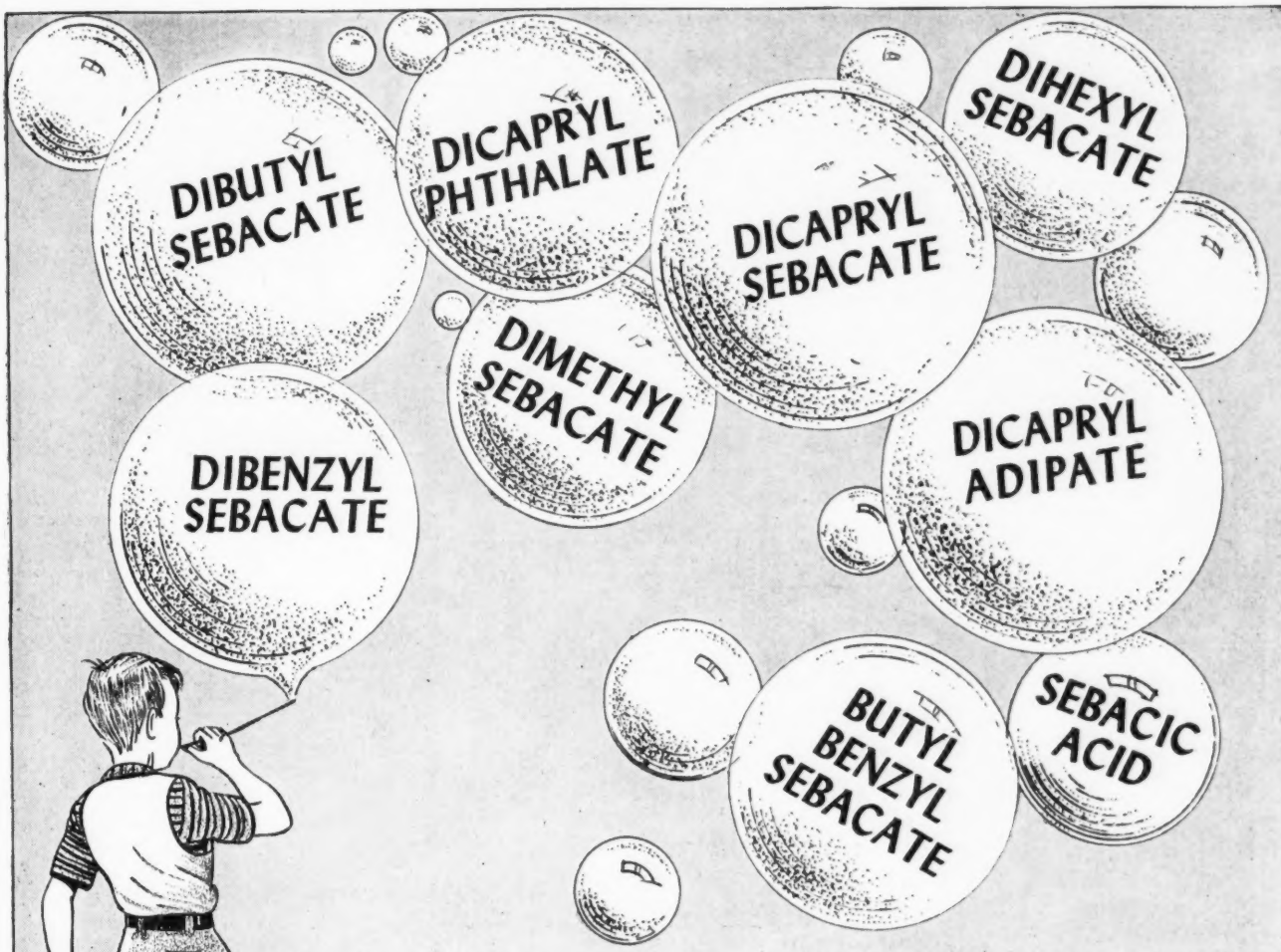
The 2-ethyl hexyl ester of citric acid. Very low volatility and water solubility. M.W., 528.7; assay, over 99%; Sp.G. (@ 25°C.), 0.972; R.I. @ 26° C., 1.4511; heat test (1 hr. @ 150°C.) satisfactory; acidity, 0.02%; B.P., over 200°C. @ 1 mm. Suggested use: Plasticizer for vinyl resins. Available in pilot plant quantities. Chas. Pfizer & Co.

2,3,5-TRIPHENYLTETRAZOLIUM CHLORIDE

("VitaStain")* $(C_6H_5)_3CN_4Cl$. M.W., 322.5; M.P., 245°C. (dec.); colorless to faintly pinkish powder. Used as 1 to 2% aqueous solution for the determination of the germinability of seeds and the viability of organic tissue in general. Available in limited commercial quantities. Arapahoe Chemicals, Inc. *Trademark Applied For.

TRIPROPYLENE GLYCOL ISOPROYPL ETHER (DOWANOL 65A)

$C_{12}H_{26}O_4$. M.W., 234.3; Sp.G. @ 25/25°C. 0.939. B.P. @ 760 mm 257°C., @ 10 mm 124°C.; viscosity @ 25°C. 8.18 cps.; R.I. @ 25°C. 1.428; fire point 265°C. Solubility at 25°C.: 20.4 grams per 100 grams water, completely miscible with acetone, benzene, carbon tetrachloride, ethanol, ether, methanol, monochlorobnzene, petroleum ether, VMP naphtha. Although the water solubility is limited at elevated temperatures, below 16°C., it is soluble in all proportions with water. In addition to the usefulness of this compound as a solvent and coupling agent a large number of derivatives can be prepared by reaction with the alcohol group. Available in semicommercial quantities. Dow Chemical Co.



HARFLEX* PLASTICIZERS

HARCHEM offers you a complete line of Plasticizers for Vinyl Resins, Synthetic Rubbers and other plastics and Elastomers.

HARCHEM has developed a variety of Plasticizers, each with its own special combination of properties. This enables the user to select that particular product most suited to his own needs. Consult us if you have a Plasticizer problem. Our technical staff will be glad to assist you.

* Trade Mark.

HARDESTY CHEMICAL COMPANY, INC.

HARCHEM

41 EAST 42nd ST.
NEW YORK 17, N. Y.

TRIPROPYLENE GLYCOL METHYL ETHER ACETATE (DOWESTER A62B)

The high boiling point combined with excellent organic solubility and limited water solubility, suggest the use of this material as a solvent and plasticizer in lacquers and printing inks. Available in semi-commercial quantities. Dow Chemical Co.

TRIPROPYLENE GLYCOL METHYL ETHER PROPIONATE (DOWESTER P62B)

$C_{13}H_{26}O_5$. Sp. G. @ 25/25°C. 0.972; viscosity @ 25°C. 3.661 cps. @ 75°C. 1.376 cps.; fire point 143°C. Solubility at 25°C.; slightly soluble in water and completely miscible with acetone, benzene, carbon tetrachloride, ethanol, ether, n-heptane, methanol and monochlorobenzene. The high boiling point and low vapor pressure of this solvent suggests its use as a plasticizer or a very slow solvent in the lacquer and printing industry. Available in experimental quantities. Dow Chemical Co.

dl-TYROSINE

A non-essential amino acid which finds use in microbiological assay work. Available in experimental quantities. Dow Chemical Co.

n-UNDECYL BROMIDE

$C_{11}H_{23}Br$. M.W., 235.09; Sp.G. @ 20°/4° C. 1.054; B.P., 114-116°/5 mm. Water white liquid insoluble in water. Completely free of undecylenyl bromide which often contaminates bromides obtained from commercially available raw material. Chemical properties: similar to those of a normal higher alkyl bromide. Suggested use: in introducing the *n*-undecyl radical in organic syntheses. Availability: laboratory scale. Columbia Organic Chemicals Co.

UNDECYLIC ACID

$CH_3(CH_2)_9COOH$. M.W., 186.29; M.P., 27 — 28°C; Sp.G. @ 30°C., .888; Neut. Value, 290. A colorless, mobile liquid with a faint fatty odor. One of the few fatty acids of relatively high molecular weight containing an odd number of carbon atoms. Available in semi-commercial quantities. Baker Castol Oil Co.

VINYL *n*-BUTYL ETHER

CH_2=CH-O-C_4H_9. W.W., 100.16; Sp.G., 0.7803 @ 20/20°C.; B.P., 94.1°C. (760 mm.); V.P., 42 mm. Hg @ 20°C.; F.P., —112.7°C.; sol. in water, 0.3% by wt. @ 20°C.; sol. of water in, 0.09% by wt. @ 20°C.; liquid at 20°C. Chemical properties: undergoes most of the reactions typical of unsaturated compounds and unites with many compounds containing active hydrogen atoms; adds hydrogen, halogens, hydrogen halides, organic acids, alcohols, and acetals; hydrolyzes under aqueous acidic conditions; polymerizes readily. Uses: polymers and copolymers used in surgical tapes, pressure-sensitive, and glass-laminating adhesives, copolymers in coatings and lacquers, as modifier for alkyd and polystyrene resins, and as plasticizer for nitrocellulose and other plastics. Available in research quantities. Carbide and Carbon Chemicals Corp.

VINYL 2-CHLORETHYL ETHER

CH_2=CH-O-CH_2CH_2Cl. M.W., 106.55; Sp.G., 1.0493 @ 20/20°C.; B.P., 108.9°C. (760 mm.); V.P., 19 mm. Hg @ 20°C.; F.P., —70.3°C.; sol. in water, 0.3% by wt. @ 20°C.; sol. of water in, 0.39% by wt. @ 20°C.; liquid at 20°C. Chemical properties: undergoes most of the reactions typical of unsaturated compounds and unites with many compounds containing active hydrogen atoms; adds hydrogen, halogens, hydrogen halides, organic acids, alcohols, and acetals; hydrolyzes under aqueous acidic conditions; polymerizes readily. Uses: copolymers used in manufacture of heat resistant synthetic elastomers, copolymers in coatings and lacquers, and as vulcanizable thermoplastic resins. Available in pilot scale quantities. Carbide and Carbon Chemicals Corp.

VINYL ISOBUTYL ETHER

CH_2=CH—O—$CH_2CH(CH_3)_2$ M.W., 100.16; Sp.G., 0.7706 @ 20/20°C.; B.P., 83.3°C. (760 mm.); V.P., 68 mm. Hg @ 20°C.; F.P., —132•3°C.; sol. in water, 0.2% by wt. @ 20°C.; sol. of water in, 0.08% @ 20°C.; liquid at 20°C. Chemical properties: undergoes most of the reactions typical of unsaturated compounds and unites with many compounds containing active hydrogen atoms; adds hydrogen, halogens, hydrogen halides, organic acids, alcohols, and acetals; hydrolyzes under aqueous acidic conditions; polymerizes readily. Uses: polymers and copolymers used in surgical tapes, pressure-sensitive, and glass-laminating adhesives, copolymers in coatings and lacquers, as modifier for alkyd and polystyrene resins, and as plasticizer for nitrocellulose and other plastics. Available in research quantities. Carbide and Carbon Chemicals Corp.

VINYL 2-METHOXYETHYL ETHER

CH_2=CH—O—$CH_2CH_2OCH_3$. M.W., 102.13; Sp.G., 0.8967 @ 20/20°C.; B.P., 108.8°C. (760 mm.); V.P., 18 mm. Hg @ 20°C.; F.P., —82.8°C.; sol. in water, 8.8% by wt. @ 20°C.; sol. of water in, 1.8% by wt. @ 20°C., liquid at 20°C. Chemical properties: undergoes most of the reactions typical of unsaturated compounds and unites with many compounds containing active hydrogen atoms; adds hydrogen, halogens, hydrogen halides, organic acids, alcohols, and acetals; hydrolyzes under aqueous acidic conditions; polymerizes readily. Its polymers are water soluble materials. Suggested uses: copolymers in coatings and lacquers, as modifier for alkyd and polystyrene resins, and as plasticizer for nitrocellulose and other plastics. Available in pilot scale quantities. Carbide and Carbon Chemicals Corp.

VINYL METHYL ETHER

CH_2=CH—O—CH_3. M.W., 58.08; Sp.G., 0.7500 @ 20/20°C.; B.P., 6.0°C. (760 mm.); V.P., 1052 mm. Hg @ 20°C.; F.P., —121.6° C.; sol. in water, 1.5% by wt. @ 20°C.; sol. of water in, 0.38% by wt. @ 20°C., gas at 20°C. Chemical properties: undergoes most of the reactions typical of unsaturated compounds and unites with many compounds containing active hydrogen atoms; adds hydrogen, halogens, hydrogen halides, organic acids, alcohols, and acetals; hydrolyzes under aqueous acidic conditions; polymerizes readily. Polymers are cold water soluble and hot water insoluble plasticizers, for many water soluble gums. Have been used in heat sensitization of latex and other dispersions. Suggested uses: copolymers in coatings and lacquers, as modifier for alkyd and polystyrene resins, and as plasticizer for nitrocellulose and other plastics. Available in pilot scale quantities. Carbide and Carbon Chemicals Corp.

WHEAT PROTEIN, SPECIAL

R12C 201P wheat protein. Dry powder; four to six pounds per cubic foot. Soluble in hot or cold water, 60% alcohol, 85% methyl cellosolve. Most soluble at pH 6.5-7.0. Hot water solution stable. Material non-hygroscopic; 4-5% is water pick-up in dry state. 50% solids solution viscosity 3-4 poises. Good stability; apparently non-toxic. Compatible with wheat starch, Dow Latex 512, etc. Possible uses: moistening tape, envelope glue, label adhesive, liquid glue, cellophane adhesive, special adhesive for greasy or oily surfaces, rubber latex stabilizer, remoistening label gum for porcelain, metal, or glass. Availability: small quantities for experimental evaluation. General Mills Research Laboratories.

ZEREWITINOFF REAGENT

CH_3MgI in butyl ether solution. Strengths: 0.5 N, 1.0 N, 1.5 N; colorless to medium gray depending on strength. For use in the Zerewitinoff determination of active hydrogen. Packaged in 50 ml., 100 ml., and 400 ml. glass bottles. Arapahoe Chemicals, Inc.

ZINC CAPRYLATE

18% Zn. insoluble in water and alcohol. Used in the manufacture of solutions, lotions, creams and powders for the treatment of fungus infections, such as athlete's foot and ring worm of the scalp. Commercially available. Chemo Puro Mfg. Co.

ZINC UNDECYLENATE

Zn = 14½%. A white powder insoluble in water or alcohol. Use: in the treatment of fungus infections of the skin. Availability: In commercial quantities. Chemo Puro Mfg. Co.

Chemical Specialties

ACCELERATOR 52-6

Mixture of methyl and ethyl tetraalkylthiuram disulfides containing 75% methyl and 25% ethyl groups. Color, light yellow to buff; Sp.G., 1.24; M.P., approx. 100-135°C; chloroform insoluble, max. 0.5%; ash content, max. 0.3%; volatiles @ 50°C., max. 0.4%; fineness, 99.9% through 100 mesh screen. Uses: Rubber accelerator especially compounded for freedom from dusting, speedy dispersion and maximum activity. Available commercially. Sharples Chemicals Inc.

ACETATE FILM CEMENT #3409

A compounded emulsion of vinyl polymers, with added non-migrating plasticizers for adhering cellulose acetate films to paper and paperboard, such as in window envelopes, window cartons, bags and similar packages. pH 4 to 5; weight per gallon 8.8 pounds. Available in commercial quantities. Paisley Products, Inc.

ADCO PLASTIC TILE CEMENT

Adheres plastic metal or rubber tile to concrete, brick, wood or metal made from synthetic rubber, self curing, has excellent aging qualities, and remains flexible. Adhesive Products Corp.

ADFLEX FLOCKING ADHESIVE

Primarily used for flocking leather and sponge rubber. Latex base. Adhesive Products Corp.

ADFLEX FOR TOYS

A liquid rubber coating available in neutral and colors, used for waterproofing composition dolls and toys, non-inflammable. Adhesive Products Corp.

ADVAMIX

A wetting agent for pigment paste systems. Compatible with virtually all oleoresinous and synthetic finishing vehicles. Dosage of from 1% to 3% is recommended to promote faster pigment paste mixing time, finer grinds with fewer mill passes, improved final grind, and greater pigment to vehicle ratios resulting in greater mill output. Sp. G., 0.994; non-volatile, 59% color (Gardner), 11+; flash point, 125°F.; viscosity (G-H), A. Advance Solvents & Chemical Corp.

ADWELD PLASTIC CEMENT

For folding and glueing Vinyl plastic. Solvent type. Will adhere to almost any surface. Adhesive Products Corp.

AEROTEX ACCELERATOR 187

A buffered curing catalyst that produces a pH of 4.5 during the curing cycle. This pH is the optimum for curing melamine formaldehyde resins. The catalyst also can be used with urea formaldehyde resins. American Cyanamid Co.

AEROTEX ACCELERATOR 190A

A white solid used with acid curing catalysts to minimize loss in tensile strength of fabrics due to anti-wrinkle treatment. It is particularly effecitve on cotton goods. American Cyanamid Co.

AEROTEX ACCELERATOR AS

An acid salt curing catalyst. Recommended as an accelerator with Permel Resin.

AEROTEX ACCELERATOR T

An amber colored liquid curing catalyst recommended where greater stability of the bath is required. It works equally well with urea formaldehyde or melamine formaldehyde resin impregnating baths, the pH of which has been adjusted to pH 8 with triethanolamine. American Cyanamid Co.

AEROTEX CREAM 450

Urea formaldehyde condensate used as a finishing agent, wrinkle resisting agent, anti-slip finishing agent and for shrinkage control. American Cyanamid Co.

AEROTEX RESIN 110

Resin emulsion finish for cottons and hat felt sizing. American Cyanamid Co.

AEROTEX RESIN 120

Resin emulsion used as a durable finish for cellulosic textiles to increase abrasion resistance and improve hand. It is an oil-in-water type emulsion of a thermoplastic resin. American Cyanamid Co.

Inexpensive Dark Resins

AVAILABLE FOR SHIPMENT IN QUANTITY

PARADENE #1, #33, #34, #35

Melting points range from 20° to 100° C. Readily soluble in petroleum and coal-tar (aromatic) solvents.

Used in manufacture of adhesives, concrete curing compounds, electrical insulation, floor tile, linoleum, paints and varnishes, pipe coatings, textile coatings and in compounding of natural and synthetic rubber.

465 RESIN

Melting point between 105° and 120° C. Soluble in aromatic solvents and partially in petroleum solvents.

Used in the manufacture of adhesives, box toes, ethyl cellulose lacquers, impregnations, linoleum, floor tile, sealing compounds, varnishes and in the compounding of natural and synthetic rubber.

NUBA #1, #2, #3X

Melting points range from 80° to 135° C. Soluble in aromatic solvents. They are cohesive and have high molten viscosity.

Used in the manufacture of adhesives, binders, box toes, briquettes, composition insulating blocks; filling, stiffening, molding and thermal insulating compounds; leather dressings, steep-roof coatings and for compounding natural and synthetic rubber.

Write for samples and booklet describing these resins.

NEVILLE

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PITTSBURGH, 25, PA.
Chemicals for the Nation's Vital Industries

BENZOL • TOLUOL • CRUDE COAL-TAR SOLVENTS • HI-FLASH SOLVENTS
COUMARONE-INDENE RESINS • RUBBER COMPOUNDING MATERIALS • TAR PAINTS
WIRE ENAMEL THINNERS • PHENOTHIAZINE • ALKYLATED PHENOLS
RECLAIMING, PLASTICIZING, NEUTRAL, CREOSOTE, AND SHINGLE STAIN OILS

A-20

AEROTEX RESIN 121

An anionic thermoplastic resin dispersion applied to cotton and rayon textiles to impart increased abrasion resistance and a full hand, giving a finish that is resistant to washing and dry cleaning. This resin also has excellent bonding properties. American Cyanamid Co.

AEROTEX RESIN 133

An anionic thermoplastic resin dispersion that is particularly useful when combined with Aerotex Resin M-3 in producing a wrinkle resistant finish on cotton without significant loss in tensile strength. American Cyanamid Co.

AEROTEX RESIN 140

Resin emulsion finish for use as a binder for back-filling and warp-sizing. American Cyanamid Co.

AEROTEX RESIN 160

An anionic thermoplastic resin dispersion that is generally applicable to cotton and rayon where a stiffener, a body builder or a bonding agent is wanted which will withstand washing or dry cleaning. Also useful in warp sizing and in back-starching of cotton. American Cyanamid Co.

AEROTEX RESIN 301

Resin emulsion used as a durable finish for rayon and cotton. It produces a crisp, firm hand and increases abrasion resistance. American Cyanamid Co.

AEROTEX RESIN 625

Resin emulsion used as a durable finish for cotton and rayon; also for increasing life of burlap and in shrinking hat bodies. American Cyanamid Co.

AEROTEX RESIN 801

A urea formaldehyde condensate in crystalline form used as an anti-wrinkling agent, as a durable resin finishing agent, as an anti-slip and shrinkage control product particularly for rayon. This resin has exceptional stability and is therefore of interest for export. American Cyanamid Co.

AEROTEX RESIN 7513

Resin emulsion finish for cotton and synthetics, useful for building body of finsh. American Cyanamid Co.

AEROTEX RESIN M-3

Melamine formaldehyde condensate finish for textiles. Application can be varied to give durable crease resistance, shrinkage control, lusters, crispness and to inhibit gas fading of acetate dyes. American Cyanamid Co.

AEROTEX SOFTENER H

Mixed cationic and anionic agents. A durable synthetic type textile softener, especially suited for use in conjunction with most of the synthetic resin processes because of its compatibility, being equally efficient on wool, cotton, or synthetic fibers. Used as an anti-static agent on all type of fibers. American Cyanamid Co.

AEROTEX SYRUP 250. CONC.

Urea formaldehyde condensate for use as an anti-slip finishing agent, and for other durable finishes. American Cyanamid Co.

ALKYLATED AROMATIC

M. W., 260 avg., boiling range, 294-325°C (760 mm.); Sp. G., 0.8718 @ 20°/4°C; flash point, Tag open Cup, 310°F; R. I., 1.4908; color, platinum-cobalt, 20-100; odor, negligible. A high boiling hydrocarbon developed specifically as an intermediate for the manufacture of detergents of the alkyl aryl sulfonate type. May be readily sulfonated to give a detergent with excellent wetting, emulsifying, suspending, foaming, and dispersing properties. Available in commercial quantities. Shell Chemical Corp.

ALROLENES

A series of 100% active substituted ammonium salts of alkyl benzene sulfonic acid, including methyl pyridinium, methyl butyl ammonium, methyl hydroxyethyl ammonium, etc. Available as clear gel soluble or dispersible in water and organic solvents, including kerosene. Applications: as surface-active agents for aqueous or solvent systems. Availability: laboratory quantities. Alrose Chemical Co.

ALROSEPT MB

A crystalline quaternary ammonium germicidal surface-active agent; alkyl immidazolinium chloride, M.P., 90°C; soluble in water and organic solvents other than aliphatic hydrocarbons. Phenol coefficient (FDA): 475 vs. E. typhosa, 1000 vs. staph. aureus, 290 vs. E. coli (20°C). Suggested applications: sanitizing agent. Availability: commercial quantities. Alrose Chemical Co.

ALROTERGE T

A 50% solution of purified amine alkyl benzene sulfonate with foaming, detergency, wetting and solubilizing properties. Suggested uses: shampoo and cosmetic formulation; upholstery, rug cleaners; liquid household detergents. Availability: commercial quantities. Alrose Chemical Co.

ALROTHIOL

A high molecular weight alkyl thiophenol; colorless liquid B.P., 135-165°C/1mm. Freezing pt., —40°C. Sp.G., 0.9470. R.I., 1.518. M.W., 320. Insoluble in water, soluble in aqueous alkali, polar and non-polar organic solvents. Suggested applications: surface-active agent, resin plasticizer polymerization modifier; adhesives, lubricants, insecticides, flotation. Availability: laboratory quantities. Alrose Chemical Co.

ALROWAX 140

A synthetic polyamide wax available as a free flowing white powder. M.P., 140°C. Sp.G., 0.98. Low moisture absorption, good flexibility, dielectric properties and compatibilities. Suggested uses: anti-block; modifier for varnishes, electrical insulation, plastics, rubber, coatings, asphalt; anti-foam. Availability: commercial quantities. Alrose Chemical Co.

ALROWET 12

A secondary C_{12} alcohol sulfate non-foaming wetting agent for 3-15% electrolyte. Draves' test, 0.1% solution of active ingredient in 10% sodium hydroxide, sulfuric acid, sodium chloride (25°C): less than 3 sec. Suggested uses: alkali cleaners, plating, carbonizing, bleaching, pickling, cold wave solutions. Availability: commercial quantities. Alrose Chemical Co.

AMBERLITE IR-120

A high density, nuclear sulfonic-acid type ion exchanger in the form of attrition-resistant, bead-like particles. The cation exchanger has a capacity of 28 kg. as calcium carbonate per cu. ft. of resin. Neither immersion in boiling water for extended periods of time nor contact with strong oxidation-reduction media at elevated tempratures (190 F.) adversely affects the resin. Density of approximately 48 lbs. per cu. ft. in place (backwashed and drained bed volume). Moisture content is 35 to 45%. The screen grading (wet) is 16 to 50 mesh, and the resin has an effective particle size of 0.4 to 0.6 millimeters. The uniformity coefficient is 2.0 max. Recommended for use in water conditioning and such specialty uses as sugar processing, waste treatment, catalysis, plant nutrition and pharmaceutical manufacture. Available in limited quantities for evaluation. Resinous Products & Chemical Co.

AMBERLITE IRA-400

A strongly basic, synthetic resin adsorbent which will adsorb negatively charged ions from acid, neutral, and even mildly alkaline soluitons. Uniform, light-brown, granular particles shipped moist in the hydrochloride salt form. Density, 1.20 gm/cc., the screen grading (wet) is 20 to 50 mesh, and the effective size is 0.40 to 0.60 mm. The uniformity coefficient is 1.4 to 1.7. Possesses marked stability in the presence of strong alkalis and acids, and aliphatic and aromatic salts, permits such applications as: splitting of neutral salts; splitting of salts of strong bases and weak acids; and adsorbing the anions of the weakly ionized acids. Suggested for use in water conditioning problems, and "scavenger" beds can be employed to effect virtually 100% removal of phenol, carbon dioxide, hydrogen sulfide and ionic silica, while the phosphates, borates, cyanides give every indication of being adsorbed with equal effectiveness. Available in experimental quantities. Resinous Products & Chemical Co.

AMBERLITE IRC-50

A synthetic cation exchanger produced in the form of white opaque beads. Derives its exchange activity from carboxylic acid groups and exhibits high capacity. Supplied as the hydrogen (H+) derivative (free acid) in a wet, swollen condition. Density ranges from 40 to 48 lbs. per cu. ft. in place (backwashed and drained bed volume). The screen grading of the wet resin is 16 to 50 mesh and the effective particle size is 0.35 to 0.50 mm. The uniformity coefficient of the resin is 2.0 max. Suggested for consideration in the treatment of sugar solution, amino acids, enzymes, hormones, milk and milk by-products, alkaloids, viruses, anti-biotics, citrus derivatives, fermentation products, water supplies and industrial waste. Commercially available. Resinous Products & Chemical Co.

ANTI-FLOODING AGENT (AAFA)

A synthetic organic product which has been found effective in helping to reduce flooding and floating of chrome greens, iron blues, carbon blacks, and some iron oxides. In many cases, AAFA also aids in the elimination of sagging in pigmented oleoresinous finishes. Sp.G., 1.008; % active, 100; lbs. per gal., 8.4; color, amber; viscosity (G-H), E. Advance Solvents & Chemical Corp.

ANTI-LIVER FLUKE F.O.

Principally hexachlorethane finely ground and compounded with a small amount of Bentonite and flour. In this manner, the Hexachlorethane remains free-flowing. Used for the control of liver flukes in cattle and sheep. Fine Organics, Inc.

ANTI-LIVERING AGENT (AALA)

Has a low acid number and a high degree of potency. It may be incorporated into grinding liquids, added before canning, or ground into livered paints to restore fluidity. Acid number, 6-7; % active, 100; % non-volatile, 50; color, pale amber; lbs. per gal. 8.13. Advance Solvents & Chemical Corp.

ANTI-SAGGING AGENT (AASA)

A synthetic dispersing agent which contributes thixotropic action to vehicles which show pronounced sagging. Non-ionic, thus the possibility of formation of salts with metallic ions such as barium, calcium, iron, lead, etc., is eliminated. Although it may be ground in if desired, it is not necessary, as AASA is equally effective when added to thinned down enamels ready for canning. Sp.G., 1.01; % active, 100; viscosity (G-H), C; color, amber; lbs. per gal., 8.43. Advance Solvents & Chemical Corp.

AQUALIZED GUM KARAYA

USP powdered grade of gum karaya which has been specially processed to make is readily soluble within a few minutes in cold water without lumping and without the need for added solvents and wetting agents such as glycerine and alcohol. The original gum is unchanged in all physical properties including viscosity of water solutions except for its rapid and complete solubility in water. Suggested for all usual purposes, food and industrial, for which gum karaya is used. Commercially available. Glyco Products Co.

AQUALIZED GUM TRAGACANTH

USP powdered grade of gum tragacanth which has ben specially processed to make it readily soluble within a few minutes in cold water without lumping and without the need for added solvents and wetting agents such as glycerine and alcohol. The original gum is unchanged in all physical properties including viscosity of water solutions except for its rapid and complete solubility in water. Suggested for all usual purposes, food and industrial, for which gum tragacanth is used. Commercially available. Glyco Products Co.

ARWAX 612-8

A 33% stabilized dispersion of polyisobutylene in 133-135° paraffin wax. Paraffin blended with a few per cent of Arwax 612-8 results in a melt with improved adhesion, flexibility, and MVP. Also available in microcrystalline wax. American Resinous Chemicals Corp.

ARWAX 613-4

A concentrated and homogenous dispersion of Stylene in microcrystalline wax for use as addends to wax melt coatings and laminants to improve bond strength, flexibility, and moisture vapor resistance. Available in several standard grades of paraffin and microcrystalline wax. American Resinous Chemicals Corp.

#4000 BINDER

A latex compound for making flexible sheets or molded products from scrap foam sponge subber, ground cork, wood flour, cotton or wool waste. Also suitable for making hair sponge. Adhesive Products Corp.

BOXSEAL GLUE #4157

Conversion of starches produces a liquid dextrine adhesive with extremely fast setting properties. It is a heavy liquid, pale tan in color, weights 9.7 pounds per gallon, pH approximately 10. No objectionable odor, non-inflammable. Suitable for fourdrinier, cylinder kraft, jute, solid fibre, chipboard and paper. Uses include case sealing, carton sealing, labeling shipments, sealing bags, etc. Available in commercial quantities. Paisley Products, Inc.

B V S

A fine, white powder; M.P., 105-110°C. It

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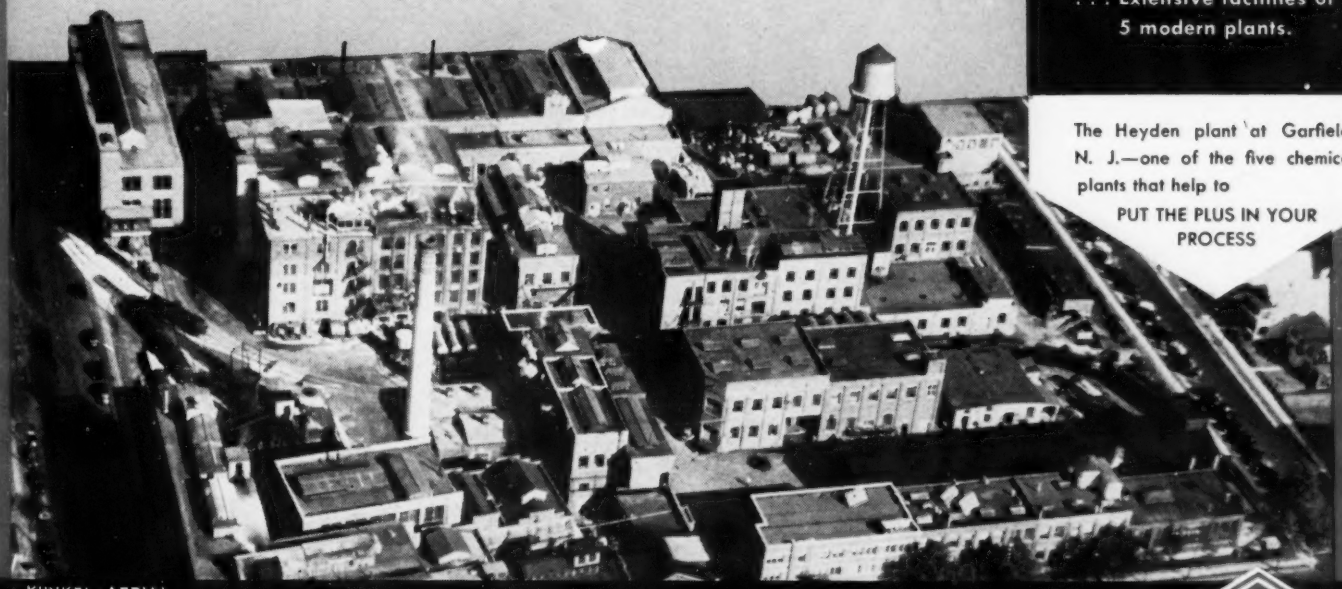
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FINE HEYDEN CHEMICALS

is an excellent stabilizer for vinyl chloride and copolymer resins, an effective lubricant, greatly aiding milling and calendering. Available in semi-commercial quantities. Baker Castor Oil Co.

CARTON ADHESIVE #2010

A compounded synthetic resin emulsion, primarily vinyl polymers, for use on Staude and International Folding Box Machines used in forming foil and acetate laminated and dry waxed cartons for the frozen food industry and other uses where cartons are subjected to damp, cold storage conditins. The emulsion is white, dries with a clear, transparent, odorless film. Gardner Mobilometer viscosity reading 75 seconds at 85° F. using a 51 hole disc and 50 gm. weight. pH 4 to 6; weight per gal. 10.15 lbs. Recommended for all direct roll applicator machines. Available in commercial quantities. Paisley Products, Inc.

CASE SEALING GLUE #1807

A high solid, dextrine base adhesive for use in Ferguson and Standard Knapp case sealing machines for sealing the flaps of corrugated containers made of jute, cylinder kraft, Fourdrinier kraft, etc. This product is white in color, pH range 8 to 9, and is reducible with water. It is also suitable for adhering wood cleats, wet or dry, to corrugated board in the manufacture of wood reinforced containers. Available in commercial quantities. Paisley Products, Inc.

CASTOR LATEX I

An aqueous dispersion of gelled castor oil. 50% solids concentration; pH 7.5. Has value as a plasticizer, tackifier and emulsifier when combined with resin or rubber emulsions. Available in semi-commercial quantities. Baker Castor Oil Co.

CELITE 408 & CELITE 410

Preformed diatomaceous silica catalyst carriers. Available sizes: Celite 408—.175″ diameter—.156″ length; Celite 410—.75″ diameter —.25″ length. Low packed density, high absorption (up to 60% own weight in water), large surface area (2.5 sq. meters per gram), high compresive strength, and high porosity (larger pore size than most active catalysts). For use in hydrogenation, de-hydrogenation, de-sulphurization, catalytic cracking, oxidation, and isomerization. Johns-Manville Sales Corp.

CELLOPHANE CEMENT #3232

A water clear, fluid, transparent resin solution for adhering a wide range of cellophane films. Forms a very flexible bond without distorting the cellophane. Has a high flash point. For adhering cellophane to cellophane, and cellophane to paper and paperboard in manufacture of cartons, bags, envelopes, etc. Solvent for thinning is carbon tetrachloride. Available in commercial quantities. Paisley Products, Inc.

CERFAK 1300

A non-ionic unsaponifiable liquid detergent of the alkylene oxide adduct type. Color pale straw, active ingredients 85%. Also a wetting and dispersing agent. Commercially available. E. F. Houghton & Co.

CERFAK LIQUID

A liquid detergent derived from sulfated amides and alkyl aryl sulfonates. Color amber, active ingredients 30%. An all-purpose cleaner. Commercially available. E. F. Houghton & Co.

CLEAR DULL CONCENTRATE 634-30

For use in solution coatings or in printing inks on unsupported vinyl film or vinyl coated fabrics. Can be combined with pigments, and will give a smooth matte finish. American Resinous Chemicals Corp.

COATING EMULSION 730-32

A high solids, aqueous dispersion of a vinyl copolymer base for use in paper and fabric coating. Requires a fluxing temperature of 250°C. for one minute to develop high water and abrasion resistant films. Formulated for use in conventional coating equipment. Available in clear and colors. 53% solids. American Resinous Chemicals Corp.

COCONUT FATTY ACID L-295-R

A fraction of whole coconut oil fatty acid from which nearly all of the C_{18} acids have been removed. I.V., 2-3; FFA (as oleic), 143%; color white; odor improved. The removal of C_{18} acids improved materially the solubility characteristics of derivatives in water. Reduction of unsaturation provides increased stability towards oxidation and color development. Suggested uses in detergents, alkyds, cosmetics. Availability: limited commercial quantities. Emery Industries, Inc.

COLLOIDAL SILICA (Ludox)

Stabilized polysilicic acid in aqueous solution. It is a faintly opalescent colloidal sol containing approximately 30% SiO_2 and .31-41% Na_2O. M.W. about 1,000,000; pH 9.5-10.5; Sp.G., 10.1 lbs. per gal. Used to modify properties of aqueous dispersions, especially film forming systems: for example, increases skid resistance of wax emulsions, reinforces latex products, increases adhesion of films, decreases tack. Also used to modify catalysts, strengthen and prevent slippage of textile fibers and yarns. E. I. du Pont de Nemours & Co.

CONCENTRATE 761-3

Free flowing, easy blending pigment paste compatible with both nitrocellulose and vinyl solution coatings. Contains only pigment, resin, and solvent. Eliminates difficulties encountered in dissolving color chips and overcomes objectionable excess plasticizer that may be encountered with pigment grinds in plasticizer. Can be made in all colors. American Resinous Chemicals Corp.

COPPER MORRHUATE

Green, stiff paste, suitable for incorporation in ointments where the therapeutic action of copper and cod liver oil fatty acids is desired. Fine Organics, Inc.

CORN PROTEIN FRACTION

Light tan powder soluble in water above pH 5.5; soluble in aqueous alcohols, glycols, and cellosolves. Shows good solution life with very little change in viscosity on standing and no tendency to gel. Suggested uses: Filming agent, coatings, adhesives, protective colloid, foaming and flotation agent ,shellac extender or substitute, emulsion polishes, etc. Typical analysis: Protein 90% or above, moisture 2-3%, oil 0.14%, ash 1.4%. American Maize-Products Co.

CRYSTALLINE PROCAINE PENICILLIN G

An antibacterial agent formed through the reaction of one molecule of Penicillin G with one molecule of procaine base. Odorless, white fine powder. Stable for at last one year without appreciable loss in potency. Contains one molecule of water of crystallizatin. Very slightly soluble in water and other solvents. Suggested uses: Pharmaceutical. Available in commercial quantities. Chas. Pfizer & Co.

CRYSTALLINE PROCAINE PENICILLIN G IN OIL

A suspension in a menstruum of refined sesame oil with dispersing agent added forming a sterile, free-flowing liquid of uniform consistency. Provides a very slow release into the circulatory system and resultant slow elimination from the body. Each ml. contains 300,000 units of penicillin, non-irritating upon injection. Stable at room temperature for one year without appreciable loss in potency. Suggested use: Pharmaceutical. Commercially available. Chas. Pfizer & Co.

DESICCITE #25

Prepared from a base structure of montmorillonite, a hydrous aluminum silicate. Inert, tasteless, odorless, non-toxic, non-abrasive, non-corrosive, and neutral. Bulk density approximately 50% greater than silica gel type of desiccant. For aiding dehydration of food products, and in packaging goods which must be protected against moisture. Available in commercial quantities. Filtrol Corp.

DETERGENT MXP

An industrial detergent comprising a balanced mixture of non-ionic active principal with synergistic alkaline builders possessing superior detergency with minimum sudsing. Suggested uses: Metal cleaning, mechanical dishwashing, dairy and shop cleaning, reclamation of rags and waste, for rendering alkaline detergent powders non-dusty and pressure jet cleaning. Availability: Commercial quantities. Monsanto Chemical Co.

DETERGENT T-12

An all-phosphate detergent mixture containing sodium triphosphate and a synthetic organic phosphate. Gives clear solutions in water and is unaffected by hardness. Washing tests indicate a high level of detergency. Its non-foaming character permits use in automatic washers. Suggested uses: general purpose detergent for home, commercial and textile processing. Availability: Commercial quantities. Victor Chemical Works.

DEXTRINASE

A powdered diastatic enzyme highly active both for liquefying and saccharifying starch; also contains potent protease and peptidase. Readily soluble in water. Suggested uses: The liquefaction or saccharification of starches. Conversion of proteins to solubilized form, polypeptides and amino acids. Commercially available. Takamine Laboratory, Inc.

DILEINE

Emulsified phenyl amine used on acetate dyed fabrics to prevent atmospheric gas fading. Jacques Wolf & Co.

DN-289*

A dormant insecticide and fungicide for fruit tree application, except peach, for the control of aphids, mites, scales and psylla. It is a stable solution that mixes readily with water and contains the triethanolamine salt of dinitro-o-*sec*-butylphenol as its active ingredient. In commercial production. Dow Chemical Co.

* Trademark

DRYING OIL UPGRADER No. 1

Viscous, straw-colored liquid of value for the upgrading of natural drying oils and the modification of alkyd resins by introducing increased conjugated unsaturation. Incorporation of 5 to 10% into an alkyd resin yields a finish which has excellent gloss and improved water, alkali, and print resistance. Such coatings through-dry very rapidly. Available in commercial quantities. Carbide and Carbon Chemicals Corp.

EMCOL H-65A

An alkyl aryl sulfonate fatty acid ester blend. Dark red mobile liquid; pH of 3% dispersion, 6.7-1.5; acid number 2-5; soluble in chlordane; insoluble in kerosene; miscible with water, alcohols, chlorinated and aromatic hydrocarbons; used as "solubilizer" for chlordane in 1:1 mixtures by weight to give stable, clear water dispersions for insecticidal spraying. Commercially available. Emulsol Corp.

EMCOL IM

Isopropyl myristate. Clear, almost water white, oily liquid; refractive index at 25°C, 1.432; free fatty acid, less than 0.1% (as myristic); saponification no., 207-211; used as non-irritating oil soluble non-greasy carrier and penetrant for cosmetic pigments, medications for topical application, skin conditioning. Commercially available. Emulsol Corp.

EMCOL MAS

A high melting point substituted amide of an edible fatty acid; cream colored wax; titer, 79-81°C.; acid number, 0.6-4.0; saponification number, 89-98; non-hydrophillic, oil soluble, not dispersable in water; used as enteric coating, hardener for wax materials. Commercially available. Emulsol Corp.

EMCOL MST

Non-self-emulsifying mono and diglycerides, derived from hydrogenated edible fats; almost white colored waxy flakes; titer, 55.8°-57.0°C; hydroxyl number 187-201; free glycerol less than 7.0%; free fatty acid less than 1%; used as emulsifier, hardener, plasticizer, thickener, anti-foamer, etc. in edible products such as baked goods, confections, cosmetics, and pharmaceuticals. Commercially available. Emulsol Corp.

EMCOL RHT

Self-emulsifying mono and diglycerides derived from edible hydrogenated fatty acids; light cream colored ivory flakes; titer, 56.3°C.; hydroxyl number, 154; pH of 3% dispersion, 8-9; free fatty acid (as stearic), 7%; used where self-emulsifying properties are required as for making aqueous paste emulsions, etc. Commercially available. Emulsol Corp.

ESTERON 245*

A weed killer liquid formulation for the control of many broad-leaved weeds, including difficult-to-kill woody and herbaceous perennials resistant to 2,4-D formulations. Its active ingredient is the isopropyl ester of 2, 4, 5-trichlorophenoxyacetic acid. In commercial production. Dow Chemical Co.

* Trademark

ESTERWAX 5

A synthetic ester possessing wax-like properties. M.P., 33-35°C; acid value, 4.0. Suggested uses: in waxes and polishes, and industrial applications such as rolling or drawing metal, molding. Available in commercial quantities. Baker Castor Oil Co.

ESTERWAX 18

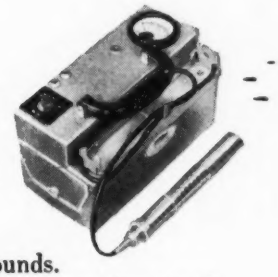
A synthetic ester possessing wax-like properties. M.P., 47-49°C; acid value 4.0. Suggested

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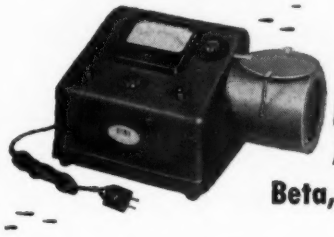
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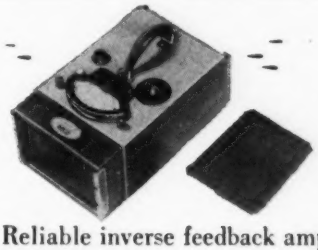
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uses: in waxes and polishes, and industrial applications such as rolling or drawing metal, molding. Available in commercial quantities. Baker Castor Oil Co.

ESTERWAX 20

A synthetic ester possessing wax-like properties. M.P., 42-45°C; acid value 6.0. Suggested uses: in waxes and polishes, and industrial applications such as rolling or drawing metal, molding. Available in commercial quantities. Baker Castor Oil Co.

EXPERIMENTAL MITICIDE NO. 6

A polyalkylene glycol derivative with excellent toxicity to mites and mite eggs. Compatible with sulfur, summer oils, pyrethrins, DDT, Fungicide 341, di-2-ethylhexyl phthalate, "Tergitol" wetting agent 7, and the "Freons" F-11 and F-12. It will dissolve 18% DDT at ordinary temperatures. Advantages include: freedom from toxicity hazards to vertebrates, even for use as an insect repellent on humans; low phytotoxicity providing a large margin of safety in agricultural use; chemical stability and inertness, even on long standing or long contact with water at high temperatures. Not corrosive; can be packaged and stored in common metal containers. Available in commercial quantities. Carbide and Carbon Chemicals Corp.

FABRIC COATING EMULSION 1041-3

A high viscosity neoprene emulsion for fabric coating. Formulated for use on conventional coating equipment. Compounded with acid acceptors, antioxidants, compounding ingredients and accelerators to yield an optimum cure at 250°F. for 20-30 min. Available in clear and pigmented form. Coating is characterized by excellent resistance to greases, oils and waxes. Replacement for solvent neoprene systems where high solids of emulsion deposit thicker films than possible with solvent solutions. 46% solids. American Resinous Chemicals Corp.

"FLEXOL"* PLASTICIZER R-1

Sp. G., 1.07 @ 20/20°C.; viscosity, 15,000 cps. @ 20°C.; coefficient of expansion 0.00073 @ 20°C.; R. I., 1.46 @ 20°C.; Fl. P. (open, cup), 505°F. A high-molecular weight polyester plasticizer for use with the vinyl chloride resins. Compatible with polyvinyl chloride, vinyl chloride-vinyl acetate copolymers, vinyl chloride-vinylidene chloride copolymers, polyvinyl acetate, nitrocellulose, polymethyl methacrylate, and chlorinated rubber. Permanence assured by resinous nature, excellent heat stability, low volatility, and resistance to both oil and water extraction. Substantially non-migrating. Uses: film products such as tablecloths, aprons, bowl covers, baby pants, and book covers, sheeting uses such as handbags, shoe uppers, and upholstery; and industrial products such as hose or tubing, wire and cable jacketing compounds, cable lacquers, and jacketing which is to be painted. Available in commercial quantities. Carbide and Carbon Chemicals Corp.

* Trademark

"FLEXOL"* PLASTICIZER TWS

Sp. G., 1.0543 @ 20/20°C.; B. P., 215°C. (0.1 mm.); V. P., 1 x 10^{-5} mm. @ 20°C.; F. P., sets to a glass below -60°C.; R. I., 1.4622 @ 20°C.; Fl. P. (open cup), 430°F.; absolute viscosity, 63.6 cps. @ 20°C.; insol. in water; sol. of water in, 0.22% by wt. @ 20°C.; coefficient of expansion, 0.00079 per °C. @ 20°C. A liquid "monomeric" plasticizer characterized by extremely low volatility, unusual heat stability, and excellent resin compatibility. Compatible with polyvinyl chloride, vinyl chloride-vinyl acetate copolymers, vinyl chloride-vinylidene chloride copolymers, polyvinyl acetate, nitrocellulose, ethyl cellulose, polymethyl methacrylate, and polystyrene. For milling operations, TWS possesses good roll-release characteristics. Suggested for use in vinyl resin films, solution coatings, and dispersion coatings; and in alkyd resin-nitrocellulose lacquers. Good pigment grinding medium for "Vinylite" VYHH pastes. Available in development quantities. Carbide and Carbon Chemicals Corp.

* Trademark

FLOVIS

Starch gel stabilizer. Non-ionic ester of wax-like properties. Color, cream; Sp. G., 1.02; M.P., 39-42°C., 0.5-2.0% based on the weight of starch prevents or definitely retards the "setting-up" or gelation of starch paste. Suggested for use in textile sizings, adhesives, etc. Commercially available. Glyco Products Co.

FLUOROSOL WS

White crystalline solid, highly soluble in water and very slightly soluble in alcohol. Suggested for use as an optical bleach on animal fibers. Available in limited quantities. Allied Chemical & Dye Corp., National Aniline Div.

FOIL LAMINANT 850-3-E

A non-oxidizing, resin modified, natural rubber latex recommended as an adhesive to bond aluminum and metal foil to paper. Meets specifications of the food packaging industry from the standpoint of odor and non-toxicity; possesses quick grab, excellent mechanical stability and develops a strong water resistant bond between the metal foil and paper. 34% solids; viscosity 5000 cps. American Resinous Chemicals Corp.

FOIL LAMINANT 874-6-C

A non-oxidizing, resin modified, synthetic copolymer latex recommended as an adhesive to bond aluminum foil to paper. Possesses quick grab, excellent mechanical stability and develops an excellent water resistant bond between the foil and paper. 40% solids; viscosity 5000 cps.; pH 8.5-9.0. American Resinous Chemicals Corp.

FORMCLEANER

Blend of fats, waxes, amines, solvents, and inert fillers. Sp. G., 1.04; pH of 1% solution 8.0; odor faint pine; color, white. Completely stable to long standing. A paste-like product which is used for cleaning hosiery forms. It is suitable for any type of metal and is applied at slightly above room temperature without the use of water. The chief value lies in the fact that after cleaning, a thin, wax-like film is left on the form, which prevents accumulation of resin finishes commonly used for nylons, makes the stocking slip on and off with greater ease, and reduces snagging tendencies. The deposit of film left will in no way cause any stains or alter the finish of the hosiery. Fabric Chemicals Co.

FUNGICIDE 658

A potato fungicide with the empirical formula $15CuO \cdot 10ZnO \cdot 6CrO_3 \cdot 25H_2O$. Free-flowing powder; color, greenish-yellow; water solubility, low. Wets readily and may be formulated as a spray or as a dust. Suggested for use on fruit, vegetable and ornamental diseases, especially early and late blight of potatoes. Available in commercial quantities. Carbide and Carbon Chemicals Corp.

HI-SIL

A fine particle size hydrated silica pigment for use in rubber and plastics compounding, Sp. G., 1.95. Particle size, .025 micron. pH, 7.0 to 8.0 but can be varied over wider range. Highly adsorptive. Produces high tensile strength, tear and abrasion resistance in natural and synthetic rubber. Vinyl resins are reinforced without losing translucency or turning white when creased. Available on semi-commercial scale. Pittsburgh Plate Glass Co., Columbia Chemical Div.

HOUGHTO-SOLV

A fuel oil sludge dispersing agent of the polyalkylaryl type, inhibited against corrosion. Color dark ember by transmitted light. Density 1.005, flash above 200°F. Available in commercial quantities. E. F. Houghton & Co.

HYDROGENATED CASTOR OIL S-751-R

A castor oil hydrogenated by a special technique to a low unsaturation. A wax of good hardness, gloss and high melting point. I. V. less than 3; free fatty acid less than 3; M.P., 82-85°C. Color, white. Suggested uses: in blends to increase softening points of other waxes, in carbon paper, greases. Availability: limited commercial quantities. Emery Industries, Inc.

HYDROGENATED COCONUT FATTY ACIDS L-552-R

A whole coconut oil fatty acid hydrogenated to remove all unsaturation. I. V. 0.5; FFA (as oleic), 136; color water white; odor good. Elimination of unsaturation provides a very stable fatty acid particularly towards discoloration. Suggested uses; in alkyds, detergents, cosmetics, where highest color stability is required. Availability:: limited commercial quantities. Emery Industries, Inc.

HY-TEN CORE OIL 304

A core binder derived from fats and petroleum based polymer oils. Fast baking properties. Commercially available. E. F. Houghton & Co.

IOSOL BLUE 6G

Yields a bright turquoise shade of blue of good fastnes to light; possesses good solubility in alcohol, very good solubility in benzol or oleic acid and fair solubility in stearic acid. Good solubility in acetone can be obtained when approximately 20% of methyl alcohol is added to the solvent. It is moderately soluble in toluol or the aliphatic esters and practically insoluble in paraffin, turpentine or water. Allied Chemical & Dye Corp., National Aniline Div.

IOSOL ORANGE

Yields a bright shade of orange of good resistance to light. It is characterized by good solubility in alcohol and very good solubility in acetone, benzol, toluol, ethyl, butyl, or amyl acetates and oleic acid. It possesses fair solubility in stearic acid or turpentine and moderate solubility in paraffin while practically insoluble in water. Allied Chemical & Dye Corp., National Aniline Div.

IOSOL RED

Produces a bright red shade of good fastnes to light; possesses good solubility in alcohol and very good solubility in acetone, benzol, toluol, ethyl, butyl, or amyl acetates, and oleic acid. It dissolves fairly well in paraffin but is practically insoluble in water. Allied Chemical & Dye Corp., National Aniline Div.

K-C.O.S.S. 35

The potassium soap of castor oil as a 35% solids solution in water. Free KOH is .05% maximum. An emulsifier for the preparation of foamed rubber. Available in commercial quantities. Baker Castor Oil Co.

LACET RESIN

Melamine formaldehyde condensate in combination with other resin types and pigments for application to cotton or rayon Nottingham lace curtains as a durable stiffener, and to control shrinkage and stretching. American Cyanamid Co.

LANASET RESIN

Melamine formaldehyde condensate used as a durable finish applied to woven and knitted wool fabrics to control wool shrinkage and felting, so that woolens can be washed. American Cyanamid Co.

LOGOQUANT

A permanent surface treatment for polystyrene plastic to impart properties of solvent resistance to many common solvents, including hydrocarbons; to impart a greater hardness to this plastic, to impart a greater luster or clarity and to impart a reduced attraction for dust. Commercially available. Bee Chemical Co.

LOMAR

Sodium salt of a condensed naphthalene sulfonate used as dispersing agent for pigments, dyestuffs, etc. and for the elimination and control of pitch and slime in paper industry. Jacques Wolf & Co.

L. T. GEAR LUBE

A synthetic fine gear lubricant and instrument oil inhibited against oxidation and corrosion. Color pale straw, viscosity 65 sec. S.S.U. at 100°F., pour point below 60°F. Available in commercial quantities. E. F. Houghton & Co.

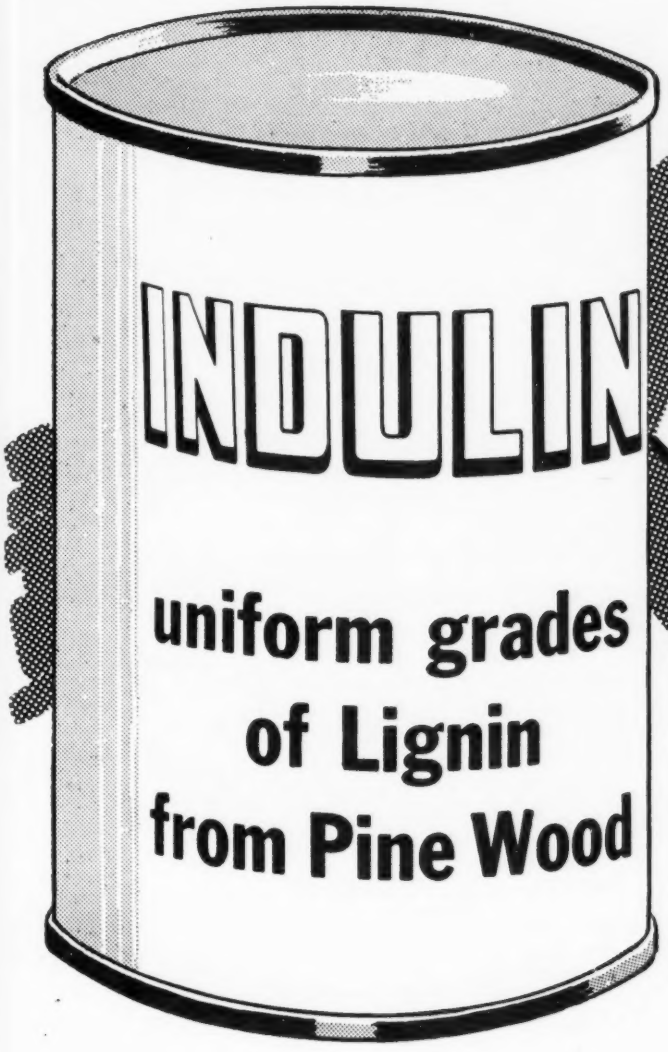
LUPERCO* ETC

50% Dibenzaldiperoxide in Tricresyl Phosphate. Active oxygen 6.6% minimum, thick grey paste weighing 10 pounds per gal., soluble in common organic solvents, insoluble in water. Suggested for use as a polymerization catalyst at temperatures above 150°C. Available in pilot plant quantities. Lucidol Div., Novadel-Agene Corp.

* Registered Trademark

MERLON BR AND BRS

Aqueous dispersions of plasticized polyvinyl butyral, 50% solids. BR contains 40% plasticizer; BRS 80% plasticizer. Milky white dispersion of thermoplastic type resin applied in dilute bath and fixed by regular drying. pH 9-10; Sp.G., 1.01-1.03; viscosity 1200-1300 cp. Textile chemicals recommended for processing and finishing fibers and fabrics. Produce a wide variety of durable finishes and coatings without curing or after treatment. Used for combining, bonding, strengthening, bodying and dyeing fibers and fabrics. Produce a soft, flexible film which imparts increased abrasion resistance and wearability. BRS yields a slightly softer film than BR. Commercially available. Monsanto Chemical Co.



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INDULIN is a standardized lignin derived from our Charleston kraft pulp mill operation. It is now available from a commercial lignin plant capable of supplying tonnage quantities.

Until recently the variability in the character of lignin has greatly retarded its commercial utilization. Samples of INDULIN are offered in the belief that investigators will find in its uniform quality an incentive to the many researches which have been deferred until a reproducible grade of lignin became available.

Work done by our Development Department indicates interesting uses for INDULIN in the following fields: rubber, ceramics, printing inks, paper, oil well drilling muds, plastics and resins, water treatment, detergents, asphalt emulsions.

TYPICAL ANALYSIS FOR INDULIN A AND INDULIN C

TESTS (dry basis except moisture)	INDULIN A	INDULIN C
Moisture, %	4.3	8.3
Ash, %	0.4	19.1
pH	3.4	9.3
Methoxyl, % CH_3O	13.9	11.5
Sulphur, %	1.4	1.8
Apparent Density, lbs. per cubic foot	25.0	25.0
Specific gravity	1.3	1.3

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MERLON KR

Aqueous dispersion of unplasticized polyvinyl acetate, 55% solids. Milky white dispersion of thermoplastic type resin applied in dilute bath and fixed by regular drying. pH 3.5 — 6.0; viscosity 4.5 to 6.5. Textile chemical for processing and finishing fibers and fabrics, which produces crisp, firm durable finishes and coatings without curing or after treatment. Imparts increased wear resistance, and has excellent adhesive and film forming properties. Recommended as fiber and fabric adhesive, pigment binder and stiffening agent, and as finish for curtains, laces, rugs, interlinings and upholstery. Commercially available. Monsanto Chemical Co.

MERLON SP

Polystyrene resin (33 percent plasticizer) dispersed in water, 40% solids. Milky white dispersion of thermoplastic type resin applied in dilute bath and fixed by regular drying. pH 8.0-9.0; Sp.G., 1.04; viscosity 15-25; wt. per gal. 8.7 lbs. A textile chemical recommended for processing and finishing fibers and fabrics, which produces smooth, lustrous durable finishes and coatings without curing or after treatment. Imparts increased strength, firmness, body, flexibility and wear resistance. Besides finishing, may be used for fiber bonding, bodying, stiffening, laminating and pigment dyeing. Commercially available. Monsanto Chemical Co.

MERLON S

Unplasticized polystyrene resin dispered in water, 40% solids. Milky white dispersion of thermoplastic type resin applied in dilute bath and fixed by regular drying. pH 8-9; SpG., 1.03; viscosity 20-30; wt. per gal. 8.6 lbs. A textile chemical recommended for processing and finishing fibers and fabrics, which produces smooth, lustrous durable finishes and coatings without curing or after treatment. Imparts increased strength, firmness, body, flexibility and wear resistance. Bonding and film forming characteristics recommend it for pile fabric backings, pigment binding, improving fiber lay, strengthening batts, thread sizing and heat sealing. Commercially available. Monsanto Chemical Co.

METHACRYLIC ACID ESTER, POLYMERS AND CO-POLYMERS

Ethyl, N-Butyl-Isobutyl co-polymer esters are water-white, mobile, volatile liquids with pronounced agreeable odors; polymers are clear, stable, transparent, thermoplastic resins. Sp. G., from ca. 0.89-0.92. Viscosities fall within specified ranges. Uses: for coating fabrics and paper, incl. hot melt coating; mfr. paints, varnishes, lacquers, enamels, etc.; adhesives, incl. hot melt. E. I. du Pont de Nemours & Co.

METHOCEL AS*

A cellulose derivative of a lower degree of substitution than the standard water-soluble Methocel. This type is insoluble in water, both hot and cold, but is soluble in dilute solutions of caustic alkalies. It is furnished in the form of fine white fibers which dissolve readily in 4% NaOH to yield smooth solutions. On acidification, Methocel AS is deposited from its solutions as a gel which dries to a tough, flexible, transparent film. Acidifying reagents include sulfuric, hydrochloric and acetic acids and solutions of alum, sodium acid sulfate or other salts whose aqueous solutions show an acid reaction. It should be useful in thickening print pastes containing alkali-soluble dyestuffs and applicable to uses in which an alkali-soluble material with water resistance is desired. Available in carload quantities. Dow Chemical Co.

* Trademark

METHOCEL HG*

A water soluble cellulose ether developed for applications where a higher gel point (loss of solution fluidity) and greater compatibility are required. Available in carload quantities in regular Methocel viscosities. Dow Chemical Co.

* Trademark

MIMOSA D

An aromatic with a Mimosa flower odor, approximating its intoxicating odor much more closely than the natural absolute. A slightly colored liquid readily soluble in all essential oils and alcohol. This perfume base is exceedingly powerful and very lasting. It is capable of an almost indefinite variety of uses as a floral sweetener. Commercially available. Dow Chemical Co.

MODICOL* L

A fatty ester which is readily dispersible in water to produce stable dispersions. Color: clear, pale yellow liquid; acid value, less than 10. Suggested uses: stabilizer for Neoprene latex, especially as a surface active agent in the coagulant solutions to produce dipped rubber goods with a smoother surface. Nopco Chemical Co.

* Trademark

NACCONOL NRCL

$RC_6H_4SO_3Na$. Sodium alkyl aryl sulfonate. M. W., 365 (organic constituent). An essentially neutral amber aqueous solution of approximately 40% solids strength containing 38% active organic ingredients. Excellent washing, foaming, and wetting properties. Stable to mineral acids and strong alkalis. Suggested for use in the manufacture of liquid household cleaners, car-wash cleaners, rug and upholstery shampoos and liquid hair shampoo compositions. Suitable for use in general wetting applications and for making "wetter water" for fire-fighting. A basic ingredient for production of built detergents. Available in commercial quantities. Allied Chemical & Dye Corp., National Aniline Div.

NACCONOL SSO

$RC_6H_4SO_3Na$. Sodium alkyl aryl sulfonates containing only a trace of inorganic salts. M. W. about 350. Light tan colored flakes essentially free of inorganic salts. Highly soluble in water giving substantially neutral solutions. Stable to mineral acids and caustic soda. Good foaming, wetting, and emulsifying properties. Suggested for use in applications where inorganic electrolytes are undesirable; specifically in cosmetics and soapless shampoo compositions. Potentially suitable as an emulsifying agent in the low temperature polymerization of synthetic rubber. Available in commercial quantities. Allied Chemical & Dye Corp., National Aniline Div.

NEOTRAN* WETTABLE

A wettable powder containing bis (*p*-chlorophenoxy) methane as its active ingredient. It has exhibited excellent acaricidal properties and is now being used commercially on citrus. It appears promising for control of European Red and other mites on deciduous fruits. One of its features is its low toxicity hazard to higher animals, offering no practical hazard to spray or dust operators or to the user of treated produce. In commercial production. Dow Chemical Co.

* Trademark

NEROSOL*

An aromatic having a fresh peppery note definitely reminiscent of the residual odor of a high grade Neroli oil. A colorless liquid, it is a pure synthetic sesquiterpene alcohol closely related to Nerolidol, which it exceeds in richness and intensity of odor without deviating from the natural note. Nerosol is of service in the duplication of such important oils and absolutes as neroli, orange blossom and rose. Exceedingly lasting and should prove an interesting material for giving a natural lift to floral compositions of the lily, carnation and lilac type. Its use in soap and cosmetics will not lead to discoloration. Commercially available. Dow Chemical Co.

* Trademark

NEUTROSCENTS*

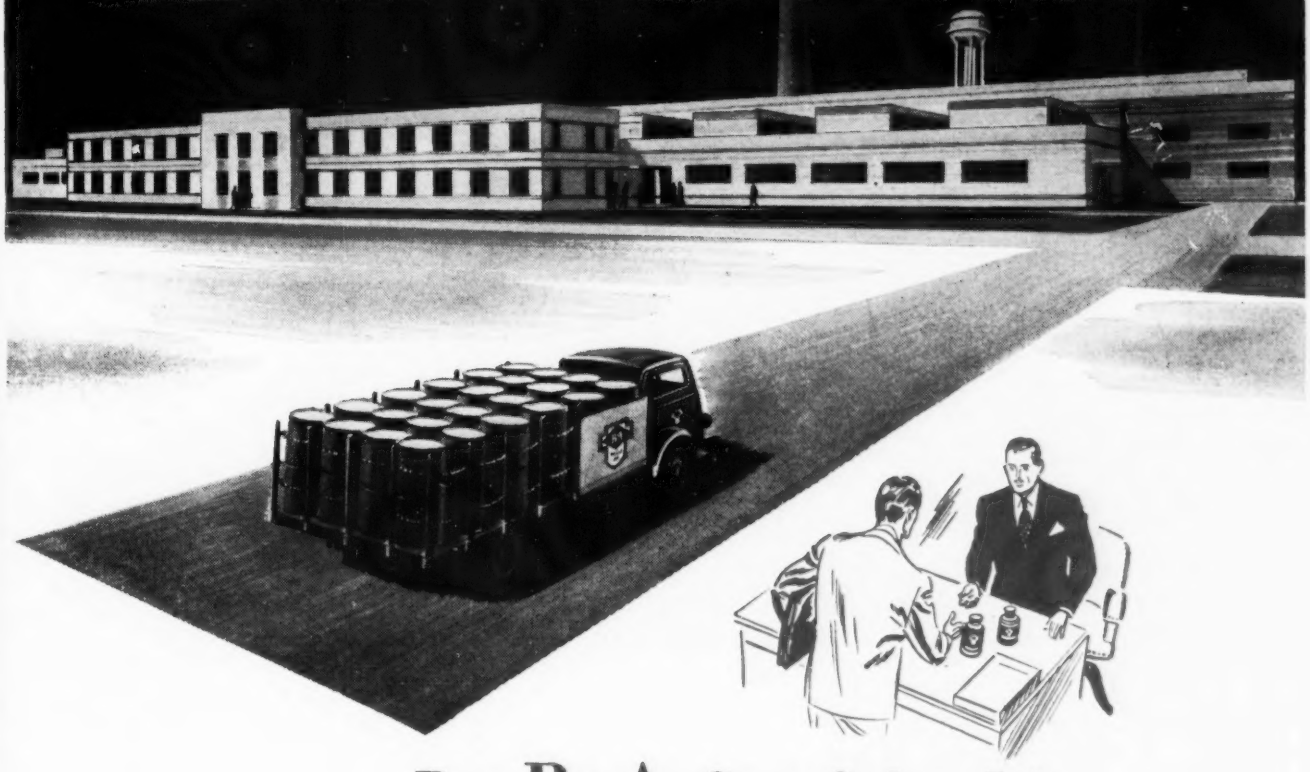
A group of aromatic compounds developed for the control of unpleasant odors such as those of the sickroom, kitchens, meeting halls and theatres, institutions, hospitals, smoking rooms, industrial plants, etc. Their purpose is first, to neutralize the objectionable odor, and second, to substitute a pleasant, new scent. Ten odor types are available and each is offered in three different forms: concentrated compounds for use in open receptacles, sprinkler-top bottles or hand atomizers, and floor waxes; water soluble compounds for use in sprays, washing and scrubbing solutions and sawdust sweeping compounds; water soluble compounds with chlorophyll green for use in wick dispersion devices, aerating devices, humidifiers, air conditioning machines and floor dressings. Fritzsche Brothers, Inc.

* Trademark Reg.

NIFOS-T

Commercial product containing 40% tetraethyl pyrophosphate as chief active ingredient. Tetraethyl pyrophosphate: $(C_2H_5O)_4P_2O_5$. M.W., 290.2; straw to brown colored liquid;

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Sp.G., 1.19 at 25°/25°C. Highly effective against insects and mites at low concentrations. Miscible with water and aromatic and polar solvents, immiscible with paraffinic solvents. In the presence of moisture, hydrolyzes to relatively non-toxic, water soluble products avoiding problems of toxic residues. May be applied as spray, dust or aerosol. Toxic to animals, but relatively non-toxic to most plants at working concentrations. Suggested uses: insecticide and rodenticide. Available in commercial quantities. Monsanto Chemical Co.

NONISOL 150

A polyoxyalkylene fatty ester. M.P., 34°C. M.W., 1200. Sp. G., (25°C), 1.04. Available as a soft white wax soluble in water, insoluble in hydrocarbons. Applications: as a solubilizing agent for perfume oils, essences, oil-soluble vitamins and hormones. Availability: commercial quantities. Alrose Chemical Co.

NONISOL 210

A polyoxyalkylene fatty ester. Solidification temperature, -10°C. Sp. G., 0.98. Surface tension 0.1% (25°C): 37 dynes/cm. Viscosity: 80 cps (25°C). Soluble in water, polar and non-polar organic solvents. Applications: insecticide emulsifier, fuel oil sludge dispersant, solvent and emulsion detergent, dry cleaning aid, lubricant. Availability: commercial quantities. Alrose Chemical Co.

NONISOL 300

A polyoxyalkylene stearate ester. Solidification temp., 30°C. Surface tension, 35 dynes/cm. (0.1% at 25°C). Iodine number, 1. acid number, 3. A soft white wax dispersible in water. Applications: starch stabilizer, plasticizer, softening and anti-staling agent for bread. Availability: commercial quantities. Alrose Chemical Co.

NOPALCOL* 10-DL

A 100% active emulsifier for preparation of concentrated emulsions of solvents, plasticizers, hydrocarbons and similar chemicals. Completely soluble in water, ethyl alcohol, toluene, vegetable oils and common ester solvents. Color: cream colored paste; M.P., 35°C. approx. Nopco Chemical Co.

* Reg. U. S. Pat. Off.

NOPCO* HBX-2

A 100% active chlordane emulsifier. One part by weight mixed with one part chlordane produces a water soluble concentrate which, upon addition to water, produces a clear colloidal solution with excellent storage stability. Soluble in water, ethyl alcohol, most aliphatic and aromatic hydrocarbons and in the common ester solvents. Color: clear, brown, viscous liquid. Nopco Chemical Co.

* Reg. U. S. Pat. Off.

NOPCOFLEX 100

A resin type plasticizer for ethyl cellulose and nitre cellulose which is of a non volatile nature and has a viscosity of Q-R on the Gardner scale. Clearly soluble in toluene and butyl acetate and exhibits excellent plasticity effects in lacquer type coatings. Color: clear, pale amber liquid; acid value: 50-60. Nopco Chemical Co.

NOPCOGEN* 14-L

A concentrated 100% active liquid synthetic detergent. Clearly soluble in water to produce solutions with a pH range of 9.0 to 9.5. Completely void of inorganic salts and ash free. Color: light amber. Suggested uses: an emulsifying and dispersing agent for pine oil, fatty esters and inorganic pigments; for washing papermakers' felts; processing woolen fabrics and degreasing skins. Nopco Chemical Co.

* Reg. U. S. Pat. Off.

NOPCOWAX 22-DS

An extremely high melting point synthetic wax exhibiting unusual hardness. Insoluble in water and ethyl alcohol; good solubility in hot toluene, naptha and vegetable oils. Color: cream colored solid; M.P., 134-136°C. Suggested uses: an efficient lubricant in molding operations and metal drawing. In powdered form, an effective lubricant for metal powders and for dusting rubber articles during processing. Nopco Chemical Co.

NOPCOWAX 11-HR

A synthetic wax useful as a replacement for natural waxes. Insoluble in water; soluble in ethyl alcohol, turpentine vegetable oils, carbon tetrachloride and toluene. Color: light tan opaque solid; Sp. G., @ 20°C., 0.971 approx.; M.P., 90-92°C.; acid value: 5.0 max. Suggested uses: in printing inks, in phonograph records and for special wax coatings. Nopco Chemical Co.

NOPCOWAX 11-S

A fatty amide type synthetic wax, soluble in ethyl alcohol, aliphatic and aromatic hydrocarbons, vegetable oils and most of the common ester type solvents. Color: light tan opaque solid; M.P., 88-90°C.; acid value: 5.0 max. Suggested uses: In formulation of polishes dental waxes and specialty wax coatings. Nopco Chemical Co.

NU-FAB

Plastic rubber paint, waterproofs and reinforces fabrics, self-curing, non-inflammable, dries in thirty minutes, washable, even in boiling water, strengthens tenderized fabrics. Adhesive Products Corp.

ORGANOSOL 771-50

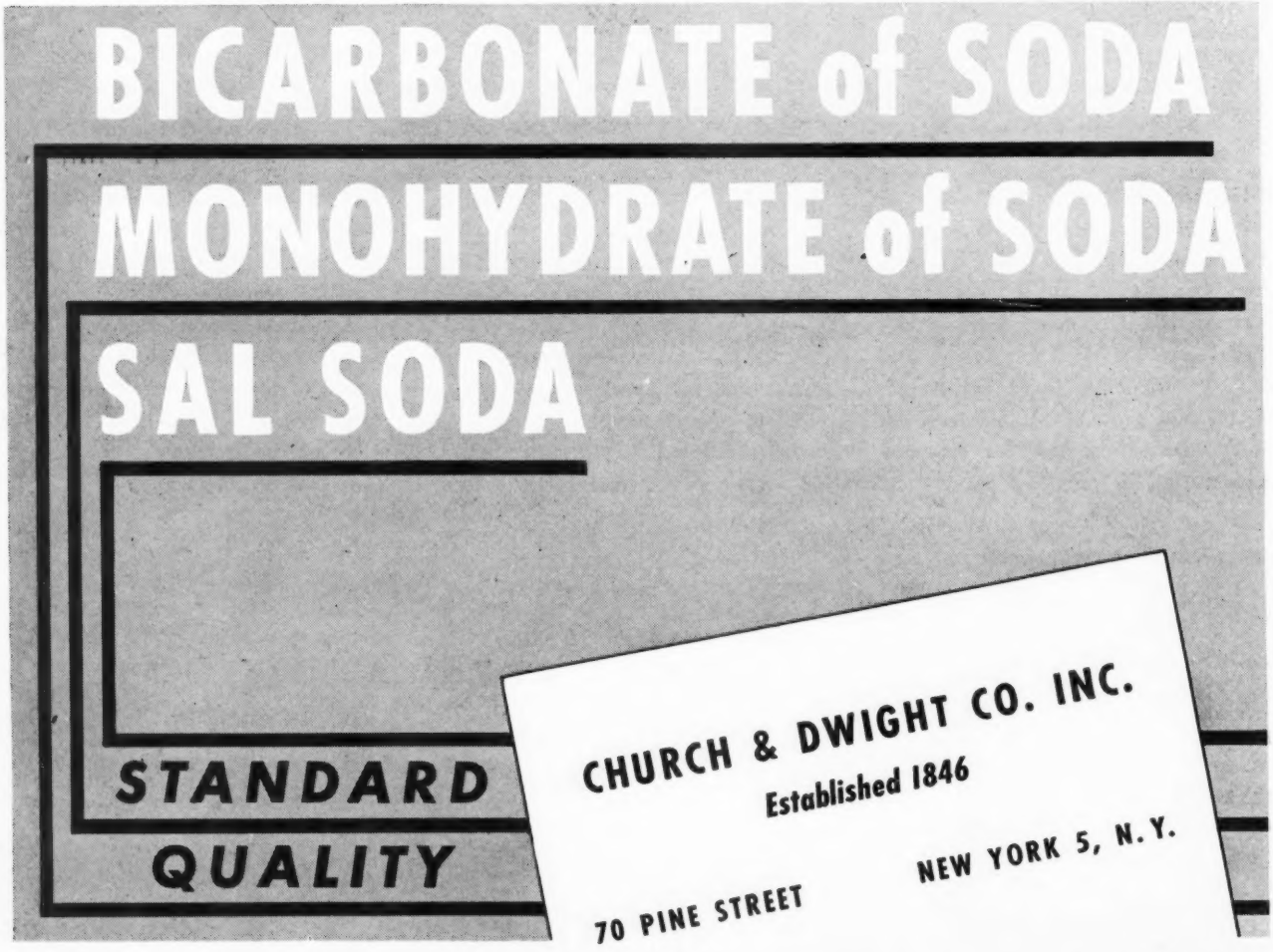
Films deposited from this dispersion will not burn or support combustion. Can be used as a coating on treated papers and fabrics or glass cloth to meet non-combustible specifications. Available in all colors. American Resinous Chemicals Corp.

PADASOL

A sodium alkyl aryl sulphonate, used in the dye-bath for dispersion of dyestuffs. Jacques Wolf & Co.

PAINT REMOVER 200X

A non-inflammable paint and varnish remover. Product is very stable, and will remove





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up to six or seven coats of paint or varnish. Stahl Finish Co.

PAPER ADHESIVE

A compounded vinyl resin emulsion, designed primarily for use as a bottom seam adhesive in the manufacture of wet wax and waxed glassine paper bags. Adhesive is white in color, drying to transparent colorless film. No stain or excess puckering of the glue line is noticeable. Water is used as the diluent for the adhesive while in the liquid state. pH is 4 to 5; weight per gal. 11.2 lbs. Available in commercial quantities. Paisley Products, Inc.

PAPER COATING EMULSION

A high gloss washable paper coating emulsion based on a styrene copolymer. For good washability and excellent light fastness on wall papers and specialty papers. Possesses excellent abrasion resistant properties. Solids content 50%, can be blended with casein or starch solutions. Stahl Finish Co.

PAPER SATURANT 867-23

Resin modified styrene-butadiene latex formulated with antioxidants, compounding ingredients and accelerators to deposit a tough, cured, elastomeric film. Gives rapid and complete saturation in high void content paper stocks and fabrics. Recommended for paper saturation where prolonged flexibility, high tear and ply resistance are required. Treated stock may be coated with nitrocellulose lacquers without discoloration. 40% solids. American Resinous Chemicals Corp.

PARATHION

O,O-diethyl O-*p*-nitrophenyl thiophosphate: $(C_2H_5O)_2PS\ OC_6H_4NO_2$. M.W., 291.3; dark brown liquid; Sp.G., 1.27 at 25°/25°C. Insecticide of high activity against a very wide variety of insects and mites. Miscible with aromatic and polar solvents; only slightly miscible in paraffinic solvents and water. Relatively non-corrosive to metals of construction and containers. Applied as spray, dust, dust suspension or aerosol. Toxic to animals. Low plant toxicity. Suggested use: insecticide. Available in semi-commercial quantities. Monsanto Chemical Co.

PEG 42

Polyoxyethylene stearate. Soft solid; color, cream; M.P., 28-31°C; water dispersible; free fatty acid %, <4; iodine value, <4. Nonionic surface active agent and emulsifier suggested as an emulsifier and dispersing agent for industrial and food uses. Commercially available. Glyco Products Co.

PERLITON W

An accelerated liquid carburizing salt bath combining light casing properties with ready cleanability. Free of heavy metal salts. Commercially available. E. F. Houghton & Co.

PERMEL RESIN

A durable water repellent for cotton, wool and synthetics in aqueous dispersion. Also, at the same time, gives shrinkage control and fabric stabilization. Can be combined with other resins to give crease resistance. American Cyanamid Co.

PERSIAN MOSS*

An aromatic which features an original spicy moss note with a rich undertone of precious wood. It is a dark green, slightly viscous liquid completely soluble in alcohol as well as in all essential oils. It may supply the perfect counterpoint for a light, heady aldehyde treatment. Commercially available. Dow Chemical Co.

* Trademark

PHORESIN

An allylic phosphorus compound. Can be readily polymerized to a hard, strong, self-extinguishing thermo-setting resin and compatibly copolymerized with vinyl acetate, methyl methacrylate, diallyl phthalate, and various unsaturated polyesters. These copolymers are characterized by their excellent optical proprties, solvent resistance, hardness, and flame resistance. Copolymers containing 20-30% by weight of Phoresin are rendered self-extinguishing. Rapid cures can be effected. Suited for laminating and casting applications. Availability: Semi-commercial quantities. Victor Chemical Works.

PLASTICIZER P-143

A low cost plasticizer for vinyl acetate and synthetic rubber. Ash, nil; Sp. G., 1.067; acid value, 0.4; saponification value, 29; flash point, 355°F.; color in Louiband units, 25 red 28 yellow; distilation, 0% 183°C., 10% 189°C., 20% 203°C., 30% 212°C., 40% 218°C. Stahl Finish Co.

PLASTISOL, CLEAR, 732-33C

Made with non-migrating type resinous plasticizers. Applications: molding and coating systems. American Resinous Chemicals Corp.

PLASTICIZER EMULSION 747-3

An aqueous emulsion of hydroabietyl alcohol depositing a water-white resinous plasticizer film. System compatible with both acidic and alkaline materials. For use per se or in conjunction with active ester type plasticizers for compounding with polyvinyl acetate emulsions. An addend for synthetic wax dispersions; tackifier for natural and synthetic rubber latices in the manufacture of adhesives, coatings and saturants; for use with nitrocellulose emulsions. 50% solids. American Resinous Chemicals Corp.

PLASTICIZER EMULSION 1041-11

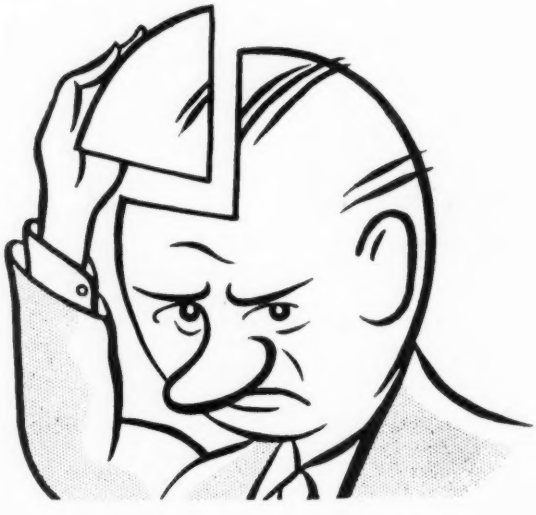
An aqueous dispersion of a modified, low molecular weight polystyrene formulated for use with polystyrene latices. Films deposited from a polystyrene dispersion plasticized with it yield clear, water-white, flexible systems possessing excellent aging properties. 50% solids. American Resinous Chemicals Corp.

PLASTOFLEX #52

A stable, colorless to very pale straw colorder, oily liquid with practically no odor. Sp.G. @ 20°C., 0.992; viscosity in centipoises, 50; F.P., approx., —45°C.; B.P. @ 5 mm. Hg, 200°C.; acidity, max., 0.03; color (Gardner), 2; 165. per gal., 8.25. A plasticizer for the vinyl chloride polymers, and vinyl chloride-acetate copolymers. Compatible in all proportions with these resins, and in ratios of equal parts gives rubbery, flexible, clear films. It also gives good low tempera-

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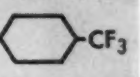
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Hooker manufactures five chlorobenzenes, principal of which are monochlorobenzene and paradichlorobenzene. These products are of exceptionally high quality to insure the best performance in your applications.

If you are not yet familiar with Hooker quality and service, we invite you to test these materials. Literature and samples are available when requested on your business letterhead.

HOOKER RESEARCH Presents

p-CHLOROBENZOTRIFLUORIDE
(p-chlorotrifluoromethylbenzene)



Molecular Weight	180.56
Freezing Point	−36° C
Boiling Point	139.3° C
Specific Gravity, 15.5°/15.5° C	1.353
Refractive Index, n20/D	1.446

The physical and chemical properties of p-chlorobenzotrifluoride indicate the possibility of many applications as a dye intermediate, chemical intermediate, solvent, and dielectric fluid.

This new Hooker product is a clear, water white, aromatic liquid. It is characterized by the trifluoromethyl group which is generally stable to heat, light and to chemical reaction.

Hooker p-chlorobenzotrifluoride is available in experimental quantities. Technical Data Sheet No. 362 describes more completely its physical and chemical properties. Please use your company letterhead when requesting sample or literature.

PARADICHLOROBENZENE
(1, 4-dichlorobenzene)

$C_6H_4Cl_2$



DESCRIPTION:
White to clear, transparent crystals with a pleasant aromatic odor. Soluble in most organic solvents; insoluble in water. Available in seven regular sizes.

PHYSICAL DATA:

Mol. Wt.	147
M. P.	53° C
B. P.	173° C
Flash Point	73° C
Fire Point	108° C

USES:
Recommended and widely accepted as a highly effective insecticide for agricultural and domestic purposes in control of: peach tree borer, black peach aphids, tobacco blue mold, clothes moths, carpet beetles, fish moths, garden centipedes, etc. Also used in the manufacture of sanitary specialties such as deodorants. As a chemical intermediate in organic synthesis, it is used in the preparation of a variety of chemicals, especially dyestuffs.

MONOCHLOROBENZENE
(phenyl chloride)

C_6H_5Cl



DESCRIPTION:
Clear, colorless, moderately volatile liquid, with a characteristic mild odor. Completely miscible with most organic solvents; immiscible with water.

PHYSICAL DATA:

Mol. Wt.	112.5
F. P.	−44° C
B. R.	131.3° to 132.3° C
Sp. Gr., 15.5°/15.5° C	1.113 ± .001
R. I., n20/D	1.524
Flash Point	29° C

USES:
Intermediate in manufacture of insecticides, dyestuffs, drugs, perfumes, and other organic chemicals; solvent for paints, varnishes, lacquers; general organic solvent; heat transfer medium for condensing vapor systems.

Technical Data Sheets on the other Hooker Chlorobenzenes: orthodichlorobenzene, trichlorobenzene, hexachlorobenzene, are also available upon request.

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HOOKER ELECTROCHEMICAL COMPANY

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ture flexibility. Of special interest in vinyl compounding because of its boiling point, which lies between those of dibutyl and dioctyl phthalate. Advance Solvents & Chemical Corp.

PLASTOFLEX FP-6

A liquid plasticizer for use in compounding flame-resistant plastics. Sp.G. @ 25°C., 1.31; B.P. @ 5 mm., 230-240°C.; color (G-H), 1-2; viscosity in centipoises, 35; lbs. per gal. 10.9. Has a wide range of compatibility with various high polymers and film formers, and shows advantages over many of the solid plasticizers of the phosphate type. It is superior to tricresyl phosphate in plasticizing action, low temperature flexibility, and resistance to sunlight and heat. Advance Solvents & Chemical Corp.

PLASTOFLEX XP-3

A plasticizer which contributes excellent low temperature flexibility to vinyl compounds. Sp.G. @ 20/20°C., 0.996; boiling range @ 5 mm., 200-215°C.; color (Hazen), 250; F.P., —28°C.; flash point, 185°C.; R.I. @ 25°C., 1.438; viscosity @ 20°C., 12.3 centipoises; V.P. @ 150°C., 16 mm. Hg; sol. in water @ 25°C., 0.18%; sol., water in @ 25°C., 0.12%; lbs. per gal. @ 25°C., 8.3. Vinyl chloride resins plasticized with it have outstanding cold resistance, and readily pass the ASTM "Break Test" at —65°F. The light resistance of vinyl compounds containing it is also improved. Advance Solvents & Chemical Corp.

P.M.C. 50

A nitrogenous material having a high molecular weight suitable for permanent mothproofing of woolen fabric. 2 pounds are being used for each 100 pounds of wool to mothproof fabric permanently and protect it against moth damage after 20 dry cleanings and 4 to 5 launderings. Fine Organics, Inc.

POLYCO 101

A water resistant polyvinyl acetate emulsion. Suggested uses: Coating for greaseproof and novelty papers; base coat for artificial leather; heat seal adhesive for paper and cloth; wet combining paper and cloth; ;base for compounding adhesives; saturant for pulp board, artificial leather, drapes, felt, box toes. Concentration 55%; pH 5; Viscosity 2'-3' Stormer. Commercially available. American Polymer Corp.

POLYCO 117-H

A stable aqueous dispersion of high molecular weight polyvinyl acetate; deposits hard, tough, continuous film. Easily compounded with low cost plasticizers to yield flexible, homogeneous, clear films with excellent aging characteristics. Suggested uses: Base coat for artificial leather; emulsion paints; greaseproof paper; heat sealing paper and cloth adhesive, wet combining paper and cloth; quick-grab wood glue; compounding base; pulpboard saturant; felt stiffener; hosiery size; finishing rayon, cotton, silk, nylon; binder for pigments, clays, leather dust. Concentration 55%; pH 4-5; Viscosity 1100 cps. Commercially available. American Polymer Corp.

POLYCO 144

A free-flowing acrylic copolymer dispersion characterized by an exceptionally fine particle size. Deposits a continuous, tough, clear, elastomeric, waterproof film with good low temperature flexibility. Absence of plasticizer or oxidizable components result in excellent aging and weathering characteristics. Suggested uses: Pigment binder for leather finishing; emulsion paint base; paper impregnant; binder for clays, pigments, talc in weighting finishes; sizes for all types of fabrics. Concentration 30%; pH 4-5, also available with pH 7-8 and in hard and soft grades; viscosity 5-10 cps. Commercially available. American Polymer Corp.

POLYCO 178

Low cost acrylic type emulsion. Suggested uses: Coating for paper; artificial leather; paper impregnant; pulpboard impregnant; launder resistant textile size; size for ribbon stock. Concentration 30%; pH 4-5; Viscosity 6-7 cps. Commercially available. American Polymer Corp.

POLYCO 200

Low cost acrylic type emulsion. Suggested uses: Coating for paper; artificial leather; paper impregnant; pulpboard impregnant; delustrant for rayon with very soft hand; addend to Polyco 178 for extreme flexibility. Concentration 30%; pH 4-5; Viscosity 6-7 cps. Commercially available. American Polymer Corp.

POLYCO 220

A free-flowing, stable, high solids, dispersion of polystyrene characterized by an exceptional-

ZIRCONIUM

by BERK

F. W. Berk & Co., Inc., long a key figure in the production of mercury and mercurials, announces its entrance into the zirconium field as a basic integrated producer.

Berk's Zirconium Products are produced at the Berk plant in Wood-Ridge, N. J., where complete facilities for the production of all types of Zirconium are being set up. Raw materials from Berk's own sources in Australia will be used.

This move follows a long-range research and development plan which eventually will provide Zirconium Products for the chemical, ceramic and metallurgical industries.

Zirconium Sulphate
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ZIRCONIUM

NEW TOOLS for INDUSTRY

for MANUFACTURERS of

✓ Adhesives
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POLYVINYL ACETATE COPOLYMERS IN SOLUTION FORM

Water White
Tough, Flexible Elastomers
Non-Yellowing, Non-Oxidizing

Resistant to Water
Oils
Aliphatic solvents

	% Solids	Vehicle	Wt./Gallon
POLYCO 265	70-75	Acetone	8.7 lbs.
POLYCO 301	55-60	Toluol	8.6 lbs.
POLYCO 309	70-75	Ethyl Alcohol	8.7 lbs.
POLYCO 310	55-60	Xylol	8.6 lbs.

Compatible with	May be Plasticized with
Nitrocellulose	Dibutyl phthalate
Phenolic Resins	Santicizer B-16, M-17
Chlorinated Rubber	Arochlors
Alkyds	Tricresyl phosphate
Nevillac Resins	Kronisol
Santolite Resins	Ethox

Uses

In laminating compositions for cellophane, acetate, paper; heat seal coatings; metal and cloth lacquers; oil resistant paints; transparentizing paper; adhesives; caulking compounds; pipe thread sealants.

POLYCO

AMERICAN POLYMER CORPORATION

PEABODY · MASSACHUSETTS

ly fine particle size. Deposits discontinuous, powdery film. Can be blended with natural and synthetic latices to reduce tack and increase tensile strength. Suggested uses: Base for papr coatings; addend to natural and synthetic latices to reduce tack; base for emulsion paints when plasticized; base for paper and pulpboard saturants; duller for hosiery, rayon, nylon and silk fabrics. Concentration 50%; pH 4-5; Viscosity 20-22 cps. Commercially available. American Polymer Corp.

POLYCO 239

A high lustre polyvinyl acetate emulsion. Suggested uses: High lustre top coat for woven paper stock; auto seat covers; size for ribbon stock; slip-proof finish for nylon, rayon, silk, etc; imparts fullness and good handle to textiles. Concentration 30%; pH 4-5, Viscosity 5-6 cps. Commercially available. American Polymer Corp.

POLYCO 262

Completed wood glue. Suggested use: Lacquer and solvent resistant wood glue. Concentration 45%; pH 4-5; Viscosity 1000 cps. Commercially available. American Polymer Corp.

POLYCO 296

An aqueous solution of the sodium salt of an acrylic acid copolymer. Not subject to the rotting, souring and mildewing commonly encountered with naturally derived gums, proteins and starches. Suggested uses: Effective thickener for natural and synthetic latices; protective colloid; dispersing medium; film former. Concentration 15%; pH 8-9; high viscosity. Commercially available. American Polymer Corp.

POLYCO 328—POLYCO 329

Viscous, aqueous solutions of high molecular weight polymeric salts. Polyco 328 is a sodium salt, Polyco 329 is an ammonium salt. Suggested uses: Warp sizing of textiles; textile and paper finishing; combined protective colloid and emulsifier for oil in water emulsions; latex thickener; additives in leather tanning; adhesive. Concentration 25%; pH 6-7. Commercially available. American Polymer Corp.

POLYCO 330

An alkali soluble high polymer derivative. Forms clear, viscous, homogeneous aqueous solutions with alkalis. Soluble in ketones and esters. Can be heated with alcohols to form resinous derivatives for use as plasticizers and replacemnt of alkyds. Suggsted uses: Film former and base for resins and plasticizers in the paint, varnish and lacquer industries. The sodium and ammonium salts serve as synthetic gums, printing pastes, textile sizes and tanning aids. Available as fine white powder. Available in pilot-plant quantities. American Polymer Corp.

POLYCO 331

Free flowing, concentrated stable aqueous dispersion of a copolymer resin which deposits a continuous, tough, flexible film. Does not require heating to cure. Available in hard and soft grades. Suggested uses: Base for flat and gloss water paints; binder for pigments and clays to coat paper, cloth and leather; addend to natural and synthetic latices to reduce tack; permanent size for textiles. Concentration 50%; pH 7-8. Commercially available. American Polymer Corp.

781 POLYMER

A tacky, elastic gel formed from polymerized castor oil. Has excellent milling and dispersing action in rubber and flooring compositions. Improves cementing properties of acryonitrile type of rubber and the extrusion of all elastomers. Available in commercial quantities. Baker Castor Oil Co.

POLYMETHACRYLIC ACID SIZE

Fine white powder containing 5-8% water. Sol. hot and cold water, methanol, ethanol. Aq. soln. completely miscible with polyhydric alcohols. Use: slasher size for weaving nylon yarns. E. I. du Pont de Nemours & Co.

POLY PLASTICIZER 1041-10

A 100% solids liquid plasticizer for use with polyvinyl acetate and nitrocellulose solutions and dispersions for adhesives and coatings. American Resinous Chemicals Corp.

POLYRESIN 1041-12

A 100% solids liquid resin for use with polyvinyl acetate and nitrocellulose solutions and dispersions. Imparts water resistance to polyvinyl acetate emulsions. For manufactur-

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THE NAME TO WATCH IN CHEMICALS

FOR BODYING AGENTS USE ORONITE POLYBUTENES

Where formulations require hydrocarbon polymers as bodying agents you'll find many advantages with Oronite Polybutenes. Their wide viscosity range permits the right degree of bodying for lubricants, hydraulic fluids, paste inks, flexible coatings and adhesives, to name a few.

They can be compounded with resins, waxes, oils and fatty acids. A few outstanding properties of Polybutenes are light color, flexibility, moisture resistance and exceptional stability.

Because there are many industrial uses for Polybutenes ... it may pay you to investigate this product today. A short list of applications are shown in the column to the right. Contact the Oronite office nearest you for more detailed information.

HERE ARE OTHER APPLICATIONS FOR POLYBUTENES

Electrical Insulation

Has high dielectric strength, low power factor, low temperature flexibility and impermeability to moisture.

Leather Treatment

Used in emulsions for softening, moistureproofing and immersion treatment.

Plasticizer

Increases flexibility and tackiness at low concentrations in waxes, resins and polymers with low polarity.

Powder Metallurgy

Improves moulding powder, withstands elevated operating temperatures. Noncharring, clean burn off.

Calking and Sealing Compounds

Soluble in raw and boiled linseed oil. Outstanding adhesion, elasticity and non-drying characteristics.

Milled Rubber Compounds

Gives decided softening action. Increases tackiness. Is inert to atmospheric oxidation.

Waterproofing

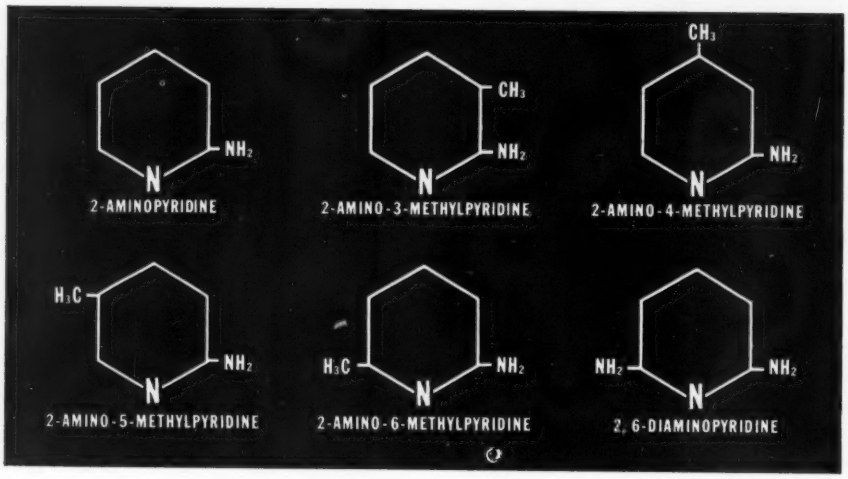
Formulation of waterproofing coatings where it contributes good moisture resistance, better adhesion and flexibility.

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One of the most interesting groups of coal tar materials developed by Reilly is the Aminopyridines, which are today recognized as chemicals of constantly increasing importance.

2-Aminopyridine, a standard Reilly product for years, is widely known for its use in the manufacture of sulfapyridine. Other recent utilizations of this product include the manufacture of medicinals for alleviation of distress of various allergies, and as a raw material in the manufacture of a preparation for preventing decay of citrus fruits.

The methylpyridines are of special interest in the pharmaceutical field, and are also suggested for investigation in the manufacture of disinfectants, insecticides, rubber chemicals, plastics, wetting agents, additives to lubricants and gasolines, photographic compounds, dyestuffs, and in various organic syntheses.

Reilly 2-Aminopyridine and 2,6-Diaminopyridine are available in 98% purity. Reilly aminomethylpyridines are available in 95% purity. Further information gladly furnished on request.

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REILLY TAR & CHEMICAL CORPORATION

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Reilly Coal Tar Chemicals For Industry

ing adhesives, saturants and coatings. American Resinous Chemicals Corp.

POLYSIZE RESINS

Free flowing aqueous dispersions of synthetic resins developed specifically for application in the textile industry. Deposit tough, water clear, launder and dry-cleaning resistant films, which do not embrittle or yellow with age. No curing required. Available in varying degrees of hardness, flexibility, toughness, addesion. Suggested uses: Permanent sizing of all types of textiles; to impart fullness, body and handle to ribbon stock, nettings, hosiery, piece goods; as binders for talcs and clays to weight textiles. Concentrations 30% to 60%. Commercially available. American Polymer Corp.

POLYSTYRENE RESINS

Thermoplastic, water-white resins available in plasticized or unplasticized powders or latices. Unaffected by common acids, alkalies and alcohols; excellent electrical properties and loss factor characteristics; temperatures up to 220°F. are possible. Not recommended where prolonged contact with petroleum derivatives and essential oils is required. Suggested uses: molding compositions in precision casting, particularly the lower polymers; hot melt adhesives; resin binder for wood, paper, cloth and glass fibers by dry fusion process; protective coatings with wide color possibilities and resistance to alkalies, acids, alcohol and water; heat sealing paper coating lacquers. Monsanto Chemical Co.

POLYVINYL ACETATE COPOLYMER SOLUTIONS

These are water white, tough, flexible elastomers, non-yellowing, non-oxidizing, resistant to water, oils and aliphatic solvents. Polyco 265—concentration 70-75%; dissolved in acetone. Polyco 301—concentration 55-60%; dissolved in toluol. Polyco 309—concentration 70-75%; dissolved in ethyl alcohol. Polyco 310—concentration 55-60%; dissolved in xylol. Suggested uses: In laminating compositions for cellophane; acetate; paper; heat seal coatings; metal and cloth lacquers; oil resistant paints; transparentizing paper; caulking compounds; pipe thread sealants. Commercially aavilable. American Polymer Corp.

PREVULCANIZED NATURAL LATEX 1041-2

A partially prevulcanized natural latex system depositing films of high tensile strength. Formulated for use as a coating or saturating material where extremely high tensile strengths are required. Tensile strengths of 5000 psi. can be developed on an air dry system or 6000 psi. can be realized after a 10 min. cure at 200°F. 55% solids. American Resinous Chemicals Corp.

PYRENONES

Proprietary insecticides based on either of the two chemicals piperonyl butoxide or piperonyl cyclonene in combination with pyrethrins. High toxicity to most forms of insect life without significant toxicity to humans or warm-blooded animals. In the form of oil sprays, aerosols, powders, emulsions, they are used in the home, on the farm, in industry and public places—on truck and garden crops, forage crops. U. S. Industrial Chemicals, Inc.

RESIN EMULSION 749-44-B

A low cost, phthallic free, modified alkyd emulsion formulated for use with GRS latices. Recommended as a fibre bonding resin in GRS paper saturants and as a tackifier base for GRS adhesives. Decreases the curing time and yields films of higher tensile strengths than does a regular GRS system. 40% solids. American Resinous Chemicals Corp.

RESIN EMULSION 842-17-E

A low viscosity aqueous dispersion of a high styrene copolymer latex depositing a continuous, clear, tough, flexible film. Does not require fluxing or elevated temperatures to obtain optimum film properties. Recommended as a base vehicle for water paints; binder for pigments and clays for coating paper, cloth, wood and leather; binder for unwoven fabrics; textile size; moisture resistant coating for foliage, citrus fruits, and flowers. 48.5% solids. American Resinous Chemicals Corp.

RESIN EMULSION 874-20

A curing type, high styrene-butadiene copolymer latex formulated with antioxidants, compounding ingredients and accelerators to yield an optimum cure at 250°F. for 15 min. Deposits an extremely tough, high Shore Durometer film possessing excellent aging properties. Recommended as a binder for pigments and clays to coat paper, cloth and leather; an addend to natural and synthetic latices to

Have you tried dissolving IT in FURFURAL?



FURFURAL has long enjoyed industrial use as a solvent so that "IT" could be any of many materials. There are many commercially available solvents, but furfural offers several special properties in addition to its solvency which make it unique. Its natural amber color limits its use in light colored coatings but this is no handicap in industrial applications where results are the prime consideration.

Resinoid Bonded Abrasive Wheels. Furfural is used as a solvent for phenol aldehyde resin. Many solvents disperse phenolic resin but furfural combines solvency with excellent wetting action on the abrasive grain, thus materially improving the strength of the finished wheel.

Industrial Coating Materials. Nitrocellulose, cellulose acetate as well as other cellulose esters, synthetic resins including vinyl types, some dyes, and a number of natural gums and resins are soluble in furfural. Again the solvent action is often joined with furfural's ability to wet surfaces. In a few instances furfural apparently acts as a reactive solvent so that as the film is deposited, the furfural reacts with a component of the film, combining with free hydroxy or other unreacted groups and decreasing the solubility of the film.

Some users have observed that films deposited from furfural show superior characteristics to similar films deposited by other solvents. Other special characteristics of furfural may be noted by solvent users.

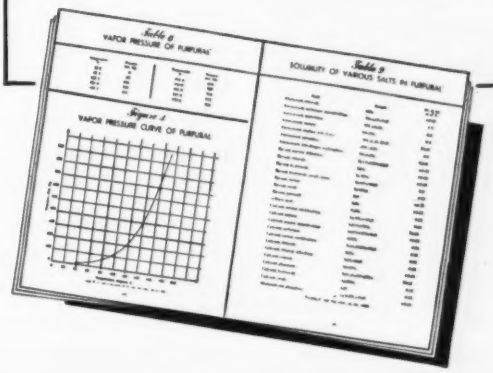
Physical Constants of Furfural

Boiling Point, °C.....	161.7	Viscosity at 25°C., Centipoises	1.49
Freezing Point, °C.....	−36.5	38°C.....	1.35
Flash Point (open cup), °C..	56.8	54°C.....	1.09
Density 20°/4°C.....	1.1598		

Solubility tables and physical data on this solvent are included in Bulletin 203 entitled "Physical Data on Furfural." Send for a copy on your company letterhead. Ask for a sample of furfural, test it as a solvent, and see what benefits it can bring you.

5 REASONS Why You Should Investigate Furfural:

1. **Uniformity**
   (Consistently good quality)
2. **Versatile Solvent Properties**
   (Wetting properties broaden usefulness)
3. **Ready Availability**
   (Raw materials from continuously renewable source)
4. **Price Stability Second to None**
   (No change in price in 5 years)
5. **Excellent Safety Record**
   (Over 25 years industrial experience)

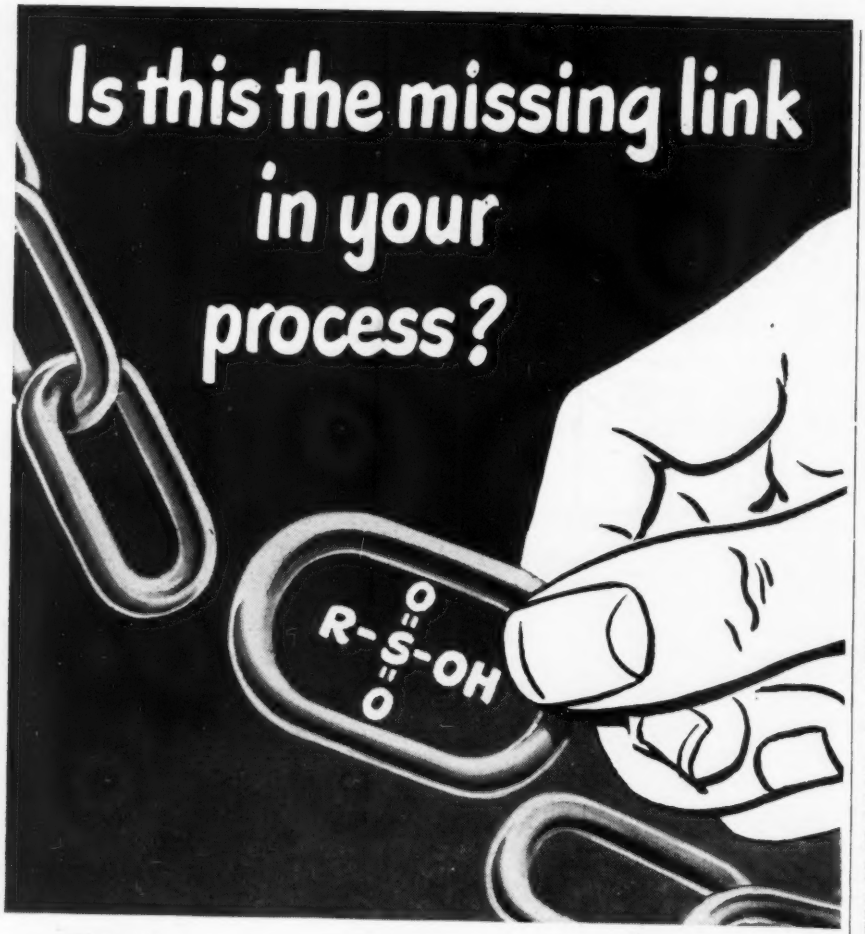


The Quaker Oats Company CHEMICALS DEPT.

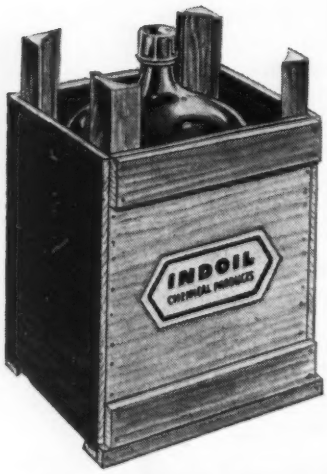
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(methane—ethane—propane)
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For further information send for Bulletin No. 11 and for price list.

. . . are strong, non-oxidizing liquid acids, miscible with water, soluble in many organic liquids, and are solvents for many complex high molecular weight organic compounds. They are unusually effective catalysts for esterification, polymerization, condensation, alkylation, and other organic reactions. The metal salts of the acids, including those of barium and lead, are highly water soluble. They are of demonstrated interest in the rapid electrodeposition of metals. Varied commercial applications of the acids and salts have been developed and many others are indicated.



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Available in limited quantities for research and evaluation.

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CHEMICAL PRODUCTS DEPARTMENT
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reduce tack and increase tensile strength; as a binder for upholstery fabrics. 40% solids. American Resinous Chemicals Corp.

RESIN EMULSION 1041-1

A low cost, non-oxidizing alkyd type resin emulsion recommended for use with both natural and synthetic rubber latices to improve tack and fibre binding properties. Suggested uses: Latex saturant modifier for paper and latex adhesive tackifier and extender. Adhesives formulated with it retain full strength over a prolonged period. 40% solids. American Resinous Chemicals Corp.

RESIN EMULSION 1041-4

A blend of Piccolastic and Arochlor resinous plasticizers in aqueous dispersions depositing an extremely tacky, soft resinous film. Recommended as a modifier and tackifier for nitrile rubber latices, natural rubber, GRS and neoprene latices. Basic resin for use in compounding specialty adhesives in bonding plastic films and metal foil to themselves and to other surfaces. 57.5% solids. American Resinous Chemicals Corp.

RESIN EMULSION 1041-5

An emulsion of Piccolastic E-50 depositing a rubbery, slightly tacky resinous film at room temperatures. Recommended as a tackifier for natural and synthetic rubber latices to produce pressure sensitive adhesives and as a basic ingredient in the formulations of adhesives for paper, cellophane, cellulose acetate and metal foils. 56% solids. American Resinous Chemicals Corp.

RESIN EMULSION 1041-6

An aqueous dispersion of a blend of Arochlors depositing a soft, tacky resinous film. Recommended as a plasticizer for ethyl cellulose emulsions where high gloss and maximum flexibility are required; as a modifier and tackifier for natural and synthetic rubber latices; for saturation of cloth, paper, wood and asbestos ; as a plasticizer for mineral and vegetable waxes and synthetic resins for use in paper and fabric coatings; as a plasticizer for nitrocellulose emulsions. 55½% solids. American Resinous Chemicals Corp.

RESIN TACKIFIER 1041-9

Emulsion derived from a modified alkyd resin base formulated for blending with natural rubber latex to produce a medium viscosity adhesive system applicable for use in bonding leather, fabric and paper. Formulated adhesives possess excellent weld and produce pressure sensitive adhesives which retain tack for several days. Base for compounding shoe adhesives. 42% solids. American Resinous Chemicals Corp.

RESIN TACKIFIER 1041-8

Emulsion of modified alkyd resins compounded with acid acceptors and antioxidants formulated for use with neoprene latices as pressure sensitive adhesive systems. Develops high strength adhesive bonds and can be used for light-colored stocks. 42.5% solids; pH, 9.0-9.5. American Resinous Chemicals Corp.

ROSIN AMINE D

A primary amine derived from modified rosin. Pale, yellow viscous liquid, insoluble in water but soluble in many organic solvents. Contains 90-95% of the primary amines of the mixed resin acids. It forms amines, secondary and tertiary amines, metal complexes, and many other derivatives, ranging from viscous liquids to hard resins, most of which are pale in color. Potential uses are in ore flotation, softeners and reclaiming agents for natural and synthetic rubbers, breaking oil emulsions encountered in producing wells, fungicides, disinfectants, rust inhibitors, lubricants, antioxidants, chemical intermediates. Available from pilot plant operation. Hercules Powder Co.

S-1079

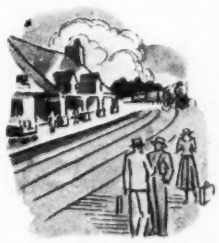
High melting point mono ester of glycerides. Hard waxy solid; color, cream; M.P., 68-75° C.; Sp.G., 1.03; free fatty acid %, <4; iodine value, <3; dispersible in hot water; soluble in hot alcohol and hydrocarbons. Suggested as of interest as a synthetic wax dispersible in hot water, as a stabilizer and emulsifier for water-in-oil emulsions. Available from pilot plant production. Glyco Products Co.

SACCHAROZYME

An enzyme complex in powdered form containing diastase, cellulase and pectin splitting enzymes. Causes an extensive hydrolysis of starch to glucose. Takamine Laboratory, Inc.



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Hardesty has "come up with the right one" for so many industries that it's more than likely they can blast the bottlenecks confronting your plant.

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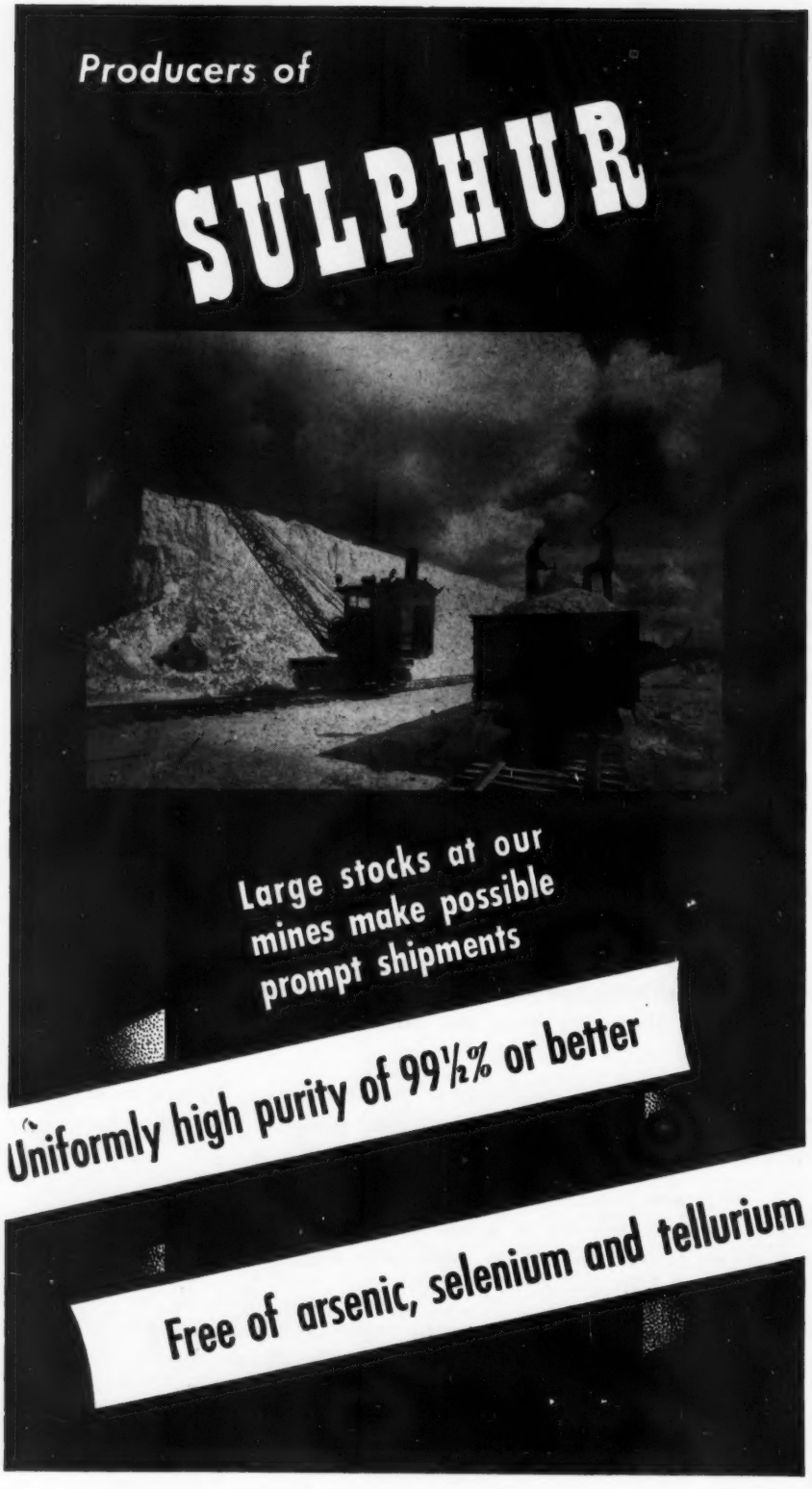
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Hydrogenated Fatty Acids Animal and Vegetable Distilled Fatty Acids

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SANTICIZER 141

A non-volatile plasticizer of the aryl-alkyl type imparting excellent low temperature flexibility and flameproofing properties to polyvinyl chloride, polyvinyl chloride—acetate and Buna-N type synthetic rubbers. Light colored liquid with slight odor; b.p., approximately 375°C. (760 mm.); fluid at —30°C.; Sp.G., 1.09 at 25°/25°C.; refractive index, 1.51-1.52 at 25°C. Suggested for use in coated textile, free films, tablecloths, shoe soles and floor tile as well as in such products made from Buna-N type synthetic rubber as diaphragms, hose, and conveyor belting. Commercially available. Monsanto Chemical Co.

SANTICIZER 160

A phthalate type plasticizer for polyvinyl chloride, polyvinyl chloride—acetate, polyvinyl butyral, ethyl cellulose and nitrocellulose. Water-white, oily liquid with faint characteristic odor; B.P., approximately 370°C. (760 mm.); glassy at —40°C.; SpG., 1.12 at 25°/25°C.; R.I., 1.53-1.54 at 25°C. Has superior permanence, oil resistance, flexibility and stability; of interest to the textile coating, plastic, protective coating and electrical insulation industries. Commercially available. Monsanto Chemical Co.

SANTODEX

An all hydrocarbon, viscous, light colored oil additive. Sp.G., 0.899 at 60°/60°F.; viscosity, 30,000 S.U.S. @ 100°F., 1,900 S.U.S. @ 210°F.; flash point, 350°F. Improves the viscosity index of lubricating oils. Commercially available. Monsanto Chemical Co.

SANTOPOID 29

An amber, viscous oil additive; Sp.G., 1.09 at 60°/60°F.; flash point, 395°F.; pour point, 45°F.; viscosity, 268 S.U.S. @ 100F., 48 S.U.S. @ 210°F. Provides in a single gear lubricant the performance characteristics necessary for lubricating hypoid and other gears under the diverse conditions of high speed passenger car, heavy duty truck, bus and tractor-trailer service. Available in commercial quantities. Monsanto Chemical Co.

SANTOVAR S

An alkylated polyhydroxy phenol, M.W., 318; Sp.G., ca. 1.10; sol. in ethanol, ether, dioxane, benzene and carbon tetrachloride. Color: clear, amber to orange resin. Suggested uses: as a rubber antioxidant for white and light colored articles. Availability: Commercial quantities. Monsanto Chemical Co.

SANTO WHITE

Dialkyl phenol sulfide, M.W. 358; Sp.G., 1.097; M.P., 145° min.; color, light gray to light tan powder; sol. in ethanol, acetone, ethyl acetate, ether, hot chloroform, benzene, chlorbenzene, and carbon tetrachloride. Suggested uses: as a rubber antioxidant for white and light colored articles. Availability: Commercial quantities. Monsanto Chemical Co.

SEQUESTRENE AA

A crystalline polyaminocarboxylic acid which in neutral or alkaline solution deionizes divalent and trivalent cations forming stable chelate complexes; a non-colloidal, non-hydrolyzable water-softener, sequestrant, water soluble ion exchanger. Applications: to counteract alkali earth and heavy metal trace effects on soaps, detergents, dyes, pharmaceuticals, food products, germicides, polymers, etc. Availability: commercial quantities. Alrose Chemical Co.

SHEERSET RESIN

Melamine formaldehyde condensate in combination with other resin types and pigments for application to cotton, viscose rayon and acetate rayon sheer woven fabrics and mixtures, as a durable wash-resistant, crisp, resilient finish, imparting shrinkage control and stabilization. Minimizes lint and fuzz; imparts soil resistance; assures less laundering, hence longer life. No starch required. American Cyanamid Co.

SILK SCREEN PRINTING INK 855-22

For unsupported vinyl films. Permanent, durable, lightfast, non-bleeding. Available in all colors. American Resinous Chemicals Corp.

SI-O-LITE

Amorphous silica. SiO_2xH_2O. Bulk density 4.5 lbs. per cubic foot, SiO_2 85-90%, H_2O 10-15%. R.I., 1.44-1.45. Brightness (reflective method), 0.90. Practically insoluble in common organic solvents; in water about 0.1%. One gram will dissolve in 25 cc of 5% NaOH in approximately five minutes at 45°C. Lethal to some insects such as flour weevils. Sug-

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gested uses: Insecticide, flatting agent for lacquers, catalyst carrier, carrier for oils, preparation of pure silicate solutions such as sodium or potassium silicate. Commercially available: Mallinckrodt Chemical Works.

SOLUTION 855-8

Coating for non-woven glass mat fibres. Deposits tough, lustrous film that is lightfast and durable. Available in clear and various colors. American Resinous Chemicals Corp.

SOLVACET

A mixture of esters and sodium alkyl aryl sulphonate used as a solvent for acetate dyestuffs. Jacques Wolf & Co.

SPAN 62

Sorbitan monostearate. A light-colored hard wax. Softens at about 59°C. Acid No. approx. 6. Effective as a primary emulsifier or coemulsifier for foods, cosmetics and pharmaceutical products. Hore hydrophilic than grade previously offered. Commercially available. Atlas Powder Co.

STABILIZER #3

A polymeric tin derivative for use in vinyl resins and other chlorine containing polymers. White powder, Sp.G., 1.15 (solid). Combines the properties of heat and light resistance and compatibility in formulations, with transparency in finished films; increases the heat and light stability of plasticizers hitherto considered inferior for high grade vinyl compounds. Available in pilot plant quantities. Advance Solvents & Chemical Corp.

STABILIZER 21

A neutral, organic phosphate in the form of a yellow liquid, miscible in all proportions with water and most organic solvents, with the exception of aliphatic hydrocarbons. It cannot be distilled without decomposition, and is non-volatile at ordinary temperatures. Suggested uses: as a stabilizer toward light for vinyl plastic films. Availability: Commercial quantities. Victor Chemical Works.

STABILIZER A-5

Extremely high-boiling liquid suitable for use as a stabilizer for vinyl resin solutions, dispersions, and calendering compositions. Available in drum quantities. Carbide and Carbon Chemicals Corp.

STALACETATE

A dry powder aluminum acetate easily placed in solution. Al_2O_3 content approx. 13.5%; free acid, none; iron (as Fe) .02% max.; sulfate, in bound form only; color, white. For use in manufacturing water repellant finishes for paper, fabrics and leather; used also as a dye mordant and in the preparation of lakes and pigments. Stahl Finish Co.

STEROX AW

A nondusting compounded detergent in powdered form containing non-ionic principal having minimum sudsing characteristics and built with synergistic alkaline salts and protective colloids. Suggested uses: Laundering in automatic and conventional home washers, dishwashing, reclamation of rags and waste and hand cleaner. Equally effective in hard and soft water. Availability: Commercial quantities. Monsanto Chemical Co.

STEROX CD

A non-ionic, slightly basic, detergent fluid of minimum sudsing properties. A viscous liquid weighing approx. 9 lbs. per gal. which is readily soluble in water with reduced solubility at elevated temperatures. Suggested uses: For compounding alkaline, neutral or acid detergent mixtures for industrial cleansers, bottle washing, metal cleaning, dishwashing, dairy and shop cleaning, reclamation of rags and waste and for rendering alkaline detergent powders non-dusty. Compatible and effective in combination with cationic surface active agents including quaternary ammonium compounds. Availability: Commercial quantities. Monsanto Chemical Co.

STEROX SE

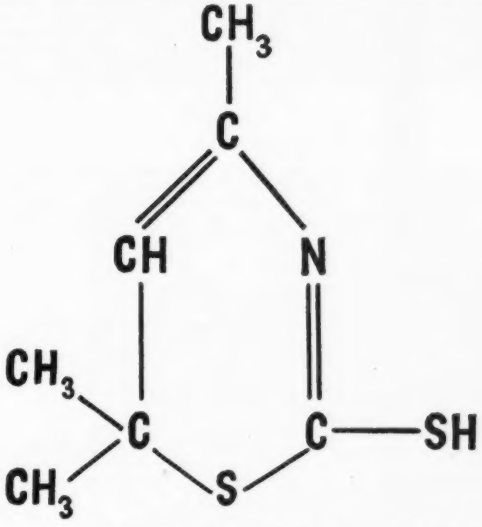
A non-ionic surface active agent and detergent of high wetting efficiency. A reddish, yellow liquid miscible with a large number of organic solvents partially soluble in most aliphatic hydrocarbons. Flame and flash point ASTM open cup greater than 200°C. Suggested uses: In compounding metal and industrial cleaners, herbicide and germicide emulsions, hand dishwashing compounds and soldering compounds. Availability: Pilot plant quantities. Monsanto Chemical Co.

STEROX SK

A non-ionic surface active agent and deter-

3 Chemicals

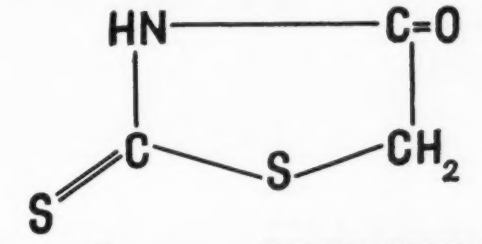
THAT MAY OPEN UP NEW FIELDS



Good-rite M.T.M.T.

2-Mercapto-4,6,6-Trimethyl Thiazine

As an intermediate, M.T.M.T. is expected to find many applications in the manufacture of wetting agents, pharmaceuticals, and other specialty chemicals not heretofore possible. As a new composition of matter, its chemical structure will suggest utility in a wide variety of fields.



Good-rite RHODANINE

2-Thio-4-Keto-Thiazolidine

This material is soluble in alcohol, ether, alkali, and hot water. Rhodanine reacts readily with aromatic aldehydes and the resulting derivatives are useful as intermediates for the manufacture of arylamino acids, arylthio-pyruvic acids, arylacetonitriles, and arylethyl amines, all with unusually high yields.

$NH_2\text{-}CH_2\text{-}CH_2\text{-}OSO_3H$

Good-rite A.E.S.A.

2-Aminoethyl Sulfuric Acid

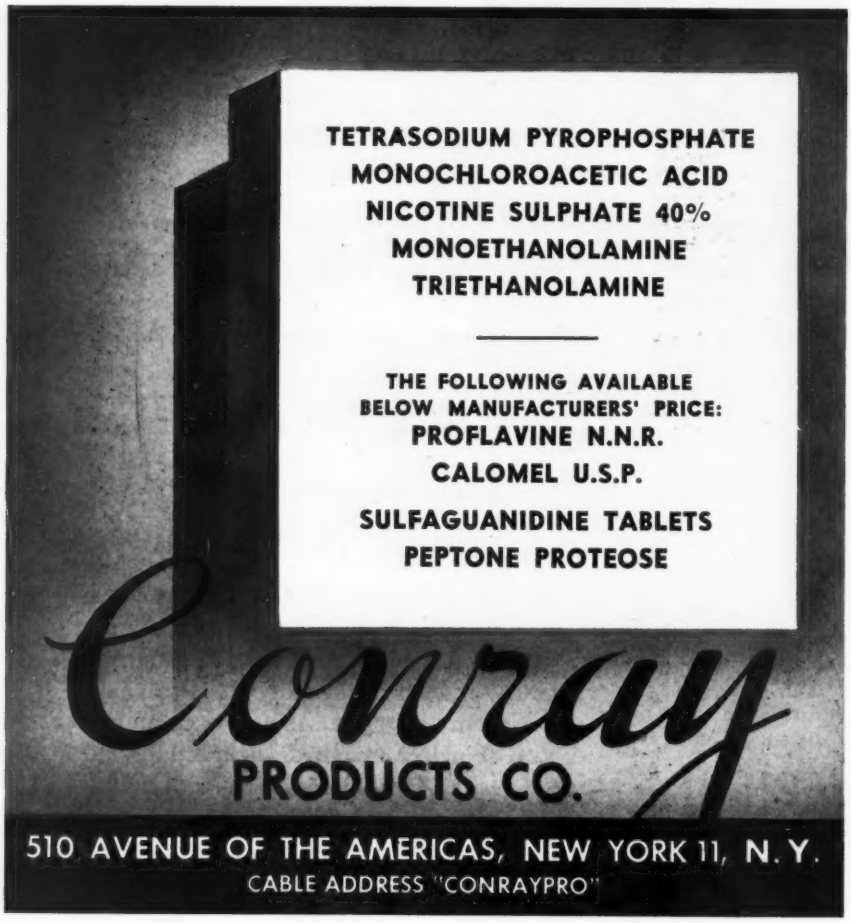
Source of Ethylene Imine. Suggested for use in the paper industry to increase wet strength and water repellency. Recent laboratory work indicates interesting results in the treatment of cotton fibres. Since aminoethyl sulfuric acid reacts with most compounds containing an active hydrogen atom, the material is widely applicable as an aminoethylating agent.

For detailed technical bulletins on these chemicals please write Department CE-9, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

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gent of high wetting efficiency. A reddish, yellow liquid miscible with a large number of organic solvents partially soluble in most aliphatic hydrocarbons. Flame and flash point ASTM open cup greater than 200°C. Suggested uses: In compounding metal and industrial cleaners, herbicide and germicide emulsions, hand dishwashing compounds and soldering compounds. Availability: Pilot plant quantities. Monsanto Chemical Co.

#469 STIX

A synthetic rubber adhesive for laminating Formica to plywood, withstands temperatures over 300°F., requires no pressure. Remains permanently flexible and is resistant to most oils, acids, alkalis, and water. Adhesive Products Corp.

SUPERSET RESIN

A resin product finish which renders cotton wrinkle resistant with little or no loss in tensile strength. It also gives adequate shrinkage control, remains durable after washing and dry cleaning, makes starching unnecessary. This finish is based on the combined use of Aerotex Resin M-3 and Aerotex Resin 133. American Cyanamid Co.

SURE-SET*

A liquid formulation containing *p*-chlorophenoxyacetic acid as the active ingredient for spray application to blossom clusters of tomato plants to set the fruit. In commercial production. Dow Chemical Co.

*Trademark

SURFAX 1266

A liquid wetting agent derived from nonionic esters and alkyl aryl sulfonates. Color reddish amber, active ingredient 45%. Also a rewetting agent and absorbency promoter. Commercially available. E. F. Houghton & Co.

SURFAX 1288

A liquid wetting agent of the aroyl sulfopropionate type. Color amber, active ingredients 35%. A dispersing and dye levelling agent. Commercially available. E. F. Houghton & Co.

SYNTHETIC TANNING AGENT

Aliphatic hydrocarbon sulfonyl chlorides, have a "built in" softener which becomes an integral part of the finished leather. Treated leather can be dyed to unusually bright colors as well as pastel shades. The end products are soft, but strong, and can be washed or dry cleaned repeatedly. Currently, the new process is being used for white and colored glove leathers, furs, and some garment leathers, as well as chamois. E. I. du Pont de Nemours & Co.

TAKIMERSE

A powdered enzymic product containing both starch and protein solubilizing enzymes. Soluble in water in concentration of 0.25% at 40°C. to 45°C. Use: For the removal of organic stains of a carbohydrate or protein nature in commercial dry cleaning by immersion of stained garments in water solution at an optimum temperature of 40°C. to 45°C. Commercially available. Takamine Laboratory, Inc.

TANNING AGENT G-942

A synthetic resin or high molecular weight carboxylic acid. Sold as the aqueous solution of the partial sodium salt — a clear, light brown viscous liquid. Use: as a tanning agent, characterized by unusual ability to plump light weight skins. Used in making suede and crushed grain types of leather. Equally desirable for white or colored leather. Also suggested for use in adhesives, textile sizing and coating compounds. E. I. du Pont de Nemours & Co.

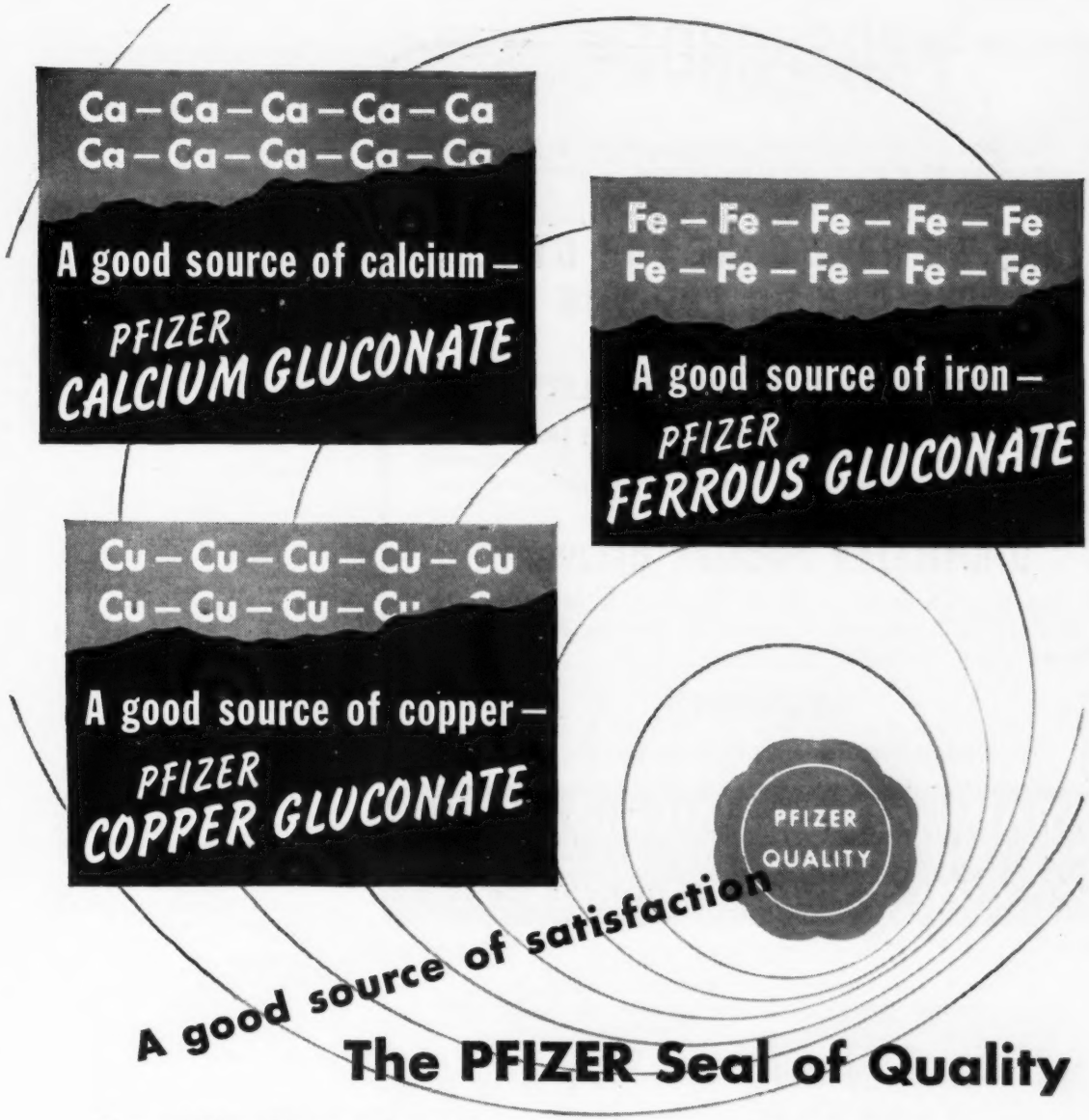
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A series of odor masking specialties developed for use in various technical products such as kerosene, cutting oils, paints, cleaning fluids, detergents, soap powders, technical solvents and numerous other materials. It has been found that in certain types of products effective deodorization is obtained by use of as little as 1/30 of 1%. Fritzsche Brothers, Inc.

*Trademark Reg. applied for.

THERMOSCENTS*

A series of aromatic deodorants developed especially for use in connection with the manufacture of products and processes involving high temperatures. The odor masking properties of these specialties find useful application in the manufacture of leather, paper, plastics, rubber, textiles, soaps, etc. Available



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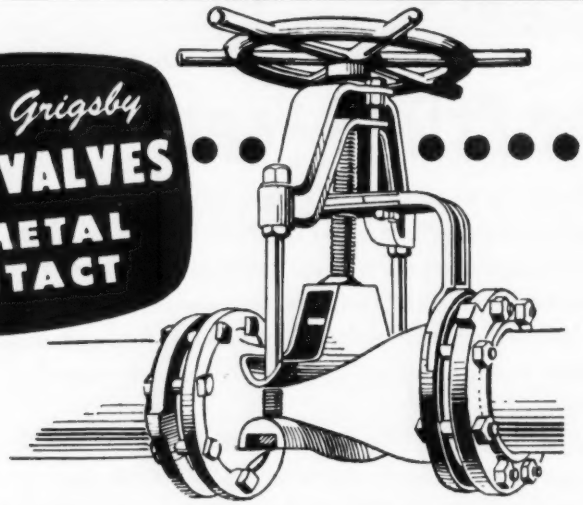
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TWITCHELL E-573-R SOLUBLE OIL

A soluble white oil of excellent color incorporating a non-ionic emulsifier, thus resistant to hard water, oxidation, etc. Suggested uses: as wool or worsted oil, as rayon oil, in specialty applications where color, ease of emulsification and stability are important. Availability: limited commercial quantities. Emery Industries.

ULTRAX 20

A water white mixture of predominately straight chain paraffin hydrocarbons averaging 20 carbon atoms per molecule. M.P., 35.6°C.; Sp.G. at 80°C., 0.7483; distillation range °C. at 10 mm. pressure—initial boiling point, 182.0, 50%, 196.1, and D.P., 204.4. Suggested for use in the production of surface active agents, halogenated paraffins, and as an ingredient in cosmetics and pharmaceutical products which require a solid melting at about body temperature. Atlantic Refining Co.

UNISIZE*

A synthetic, water soluble polymer which forms a smooth, tough, flexible film. Dissolves quickly in warm water without gelling or lumping. Color: light tan, free-flowing granulation; moisture: 8% approx.; pH 2% solution: 7.5. Suggested use: for warp sizing acetate and viscose continuous filament rayon yarns. Nopco Chemical Co.

*Trademark.

ULTRASOL

Polyvinyl chloride resin dispersed in an organic thinner composed of plasticizers, active and non-active solvents. A coating much higher in solids content than other fabric coatings. Viscosity, 23-28 McMichael, No. 20 wire; approx. 2600 centipoise; 65% solids; wt. per gal., 8.8 lbs. Application temperatures: Drying between 180°F and 250°F; fusing—not below 350°F. Applied as a spread coating to paper or fabric to provide a smooth, colorful finish which may be embossed to give leather-like or other decorated effects. Ease of application, rsistance to weather, flame and abrasion, and excellent flexibility over a wide temperature range recommend it for upholstery, furniture, slip covers, drapes. Resistant to acids, alkalies, alcohols, vegetable and body oils. Ultrasoled fabrics are easily washed with soap and water. Supplied in either pigmented ready-to-use products or in clear base solution. Commercially available. Monsanto Chemical Co.

"UNOX"* PENETRANT

Wetting agents combined with corrosion inhibitors—the mixture specifically designed for fire-fighting use. 1% in water greatly increases the penetrating, spreading and emulsifying characteristics, thereby improving the fire-fighting efficiency for all types of fires. Available in commercial quantities. Carbide and Carbon Chemicals Corp.

*Trademark.

VICTALUBE 5810

An organic phosphate in the form of a brown, waxy solid, melting at about 50°C. It is insoluble in water, but readily soluble in most organic solvents. Suggested uses: as an additive to lubricants to impart film strength and rust inhibition. Availability: Commercial quantities. Victor Chemical Works.

VICTAMIDE

A white, water soluble, finely divided ammonium salt of an amido-polyphosphate. Its water solutions are practically neutral. An efficient, non-crystalline flameproofing agent, will deionize and bind alkali earth and metal ions. Suggested uses: flameproofing, water softening, leather and textile processing. Availability: Semi-commercial quantities. Victor Chemical Works.

VICTAWET 58X

A white, free-flowing, solid material composed of 20% organic phosphorus-containing surface active agent, and 80% disodium phosphate. Possesses a slight odor; readily water soluble to form a clear solution; Draves sinking time of 0.5% solution (0.1% active agent) —31 sec.; pH of 1% solution approximately 8.0; stable toward mild acids and alkalies; apparent density (tightly packed) approx. 50 lbs. per cu. ft. Suggested use: for evaluation where neutral surface active agent is desired in presence of a diluent with building, water softening, and buffering capacity. Availability: Commercial quantities. Victor Chemical Works.

VICTAWET 1220

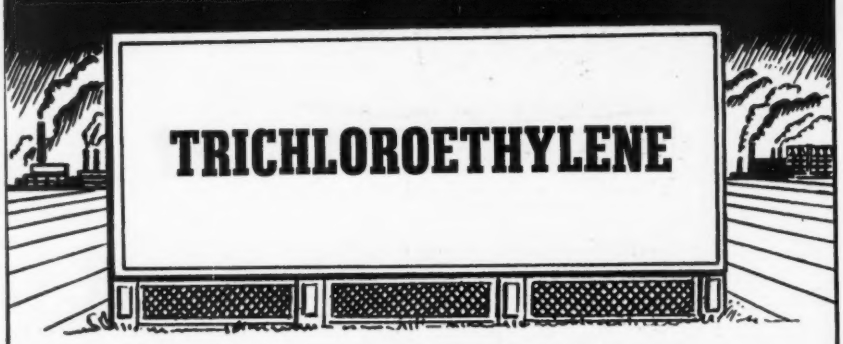
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Cargille Scientific, Inc.
116 Liberty St. New York, N.Y.

posed of 20% organic phosphorus-containing surface active agent, non-ionic in type, and 80% disodium phosphate. Possesses very slight odor and dissolves readily to form clear water solution. Draves sinking time of 0.5% solution (0.1% active agent), 24 sec.; pH of 1.0% solution approximately 8.0; stable toward moderately strong acids and alkalies; apparent density (tightly packed) approx. 59 lbs. per cu. ft. Suggested for evaluation where neutral, non-ionic surface active agent is desired in conjunction with diluent of water softening and buffering capacity. Available in commercial quantities. Victor Chemical Works.

VICTICIDE C

A tan to cream colored paste of waxy consistency composed of 100% organic phosphorus-containing surface active agent. Possesses a characteristic odor, and is dispersible in water. Draves sinking time 0.2% dispersion, 10 sec. Substantive to animal and vegetable fibers, has proved of value for inhibiting fungus growth. Suggested for evalution as fungistatic agent in textile and agricultural fields. Demonstrates marked inhibitory action toward many common fungi, can be applied as spray or dust. Availability: Commercial quantities. Victor Chemical Works.

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A dry powder pigment in casein compound which is easily placed in so'ution. Available in any color. Stahl Finish Co.

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Simplifies cleaning spray booths by forming a protective coating. Latex cement, rubber cement, and paint will peel off easily from booths and tables. May be applied by brush or spray. Adhesive Products Corp.

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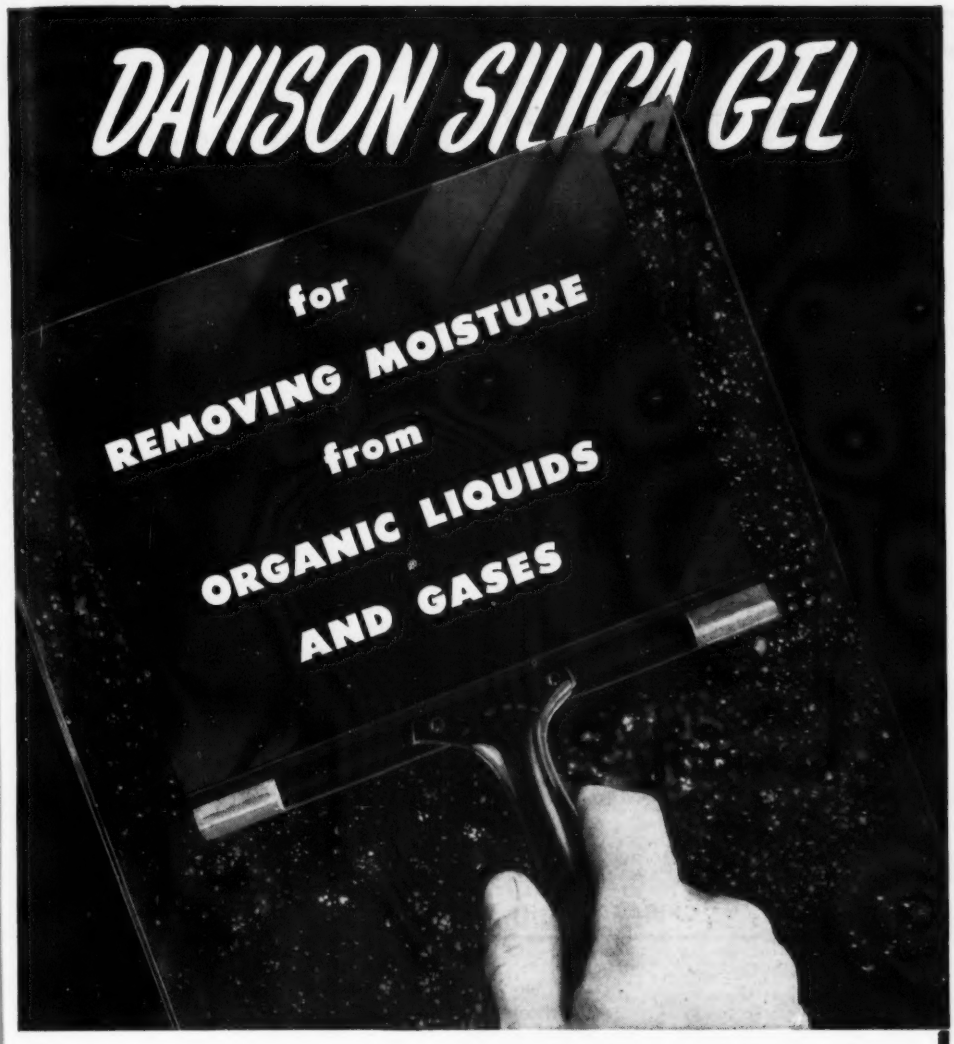
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Since many processes require custom-built dehydration equipment, the services of the Davison Engineering Division are available for specialized installations. They will cooperate with you in designing and manufacturing the equipment to meet your needs for efficient, economical drying of liquids or gases.

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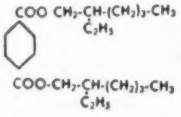
Pure Oil Building
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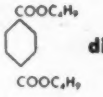
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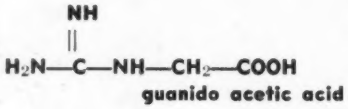
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from GENESEE
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tere-phthalic acid


iso-phthalic acid


Di(2-ethyl-hexyl)-tere-phthalate


di-n-butyl-tere phthalate

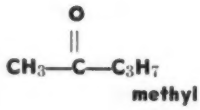

guanido acetic acid

$CH_3(CH_2)_3CHO$
n-valeraldehyde

$(CH_3)_2CHCH_2CHO$
iso-valeraldehyde

$CH_3(CH_2)_6CHO$
n-capryl aldehyde

$CH_3(CH_2)_8CHO$
n-decyl aldehyde


methyl propyl ketone

45 OTHER RARE ORGANIC CHEMICALS

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Many glass manufacturers everywhere have shown a preference for Pennsalt Hydrofluoric acid . . . and found that it fulfills exacting requirements . . . from etching precision medical instruments of glass, to frosting, polishing and etching fine decorative glassware.

In addition, Pennsalt HF is reliable for frosting electric light bulbs, pickling stainless steel, cleaning castings, improving the quality of glassmakers' sand and other important industrial raw materials . . . as well as in the preparation of fluorine compounds.

Pennsalt HF is available in strengths of 30%, 52%, 60% and 80% for domestic users; 71-75% for export. Strengths 60% and above shipped in steel containers . . . weaker strengths in rubber drums. Write for full details. Heavy Chemicals Division, Pennsylvania Salt Manufacturing Company, Philadelphia 7, Pa.

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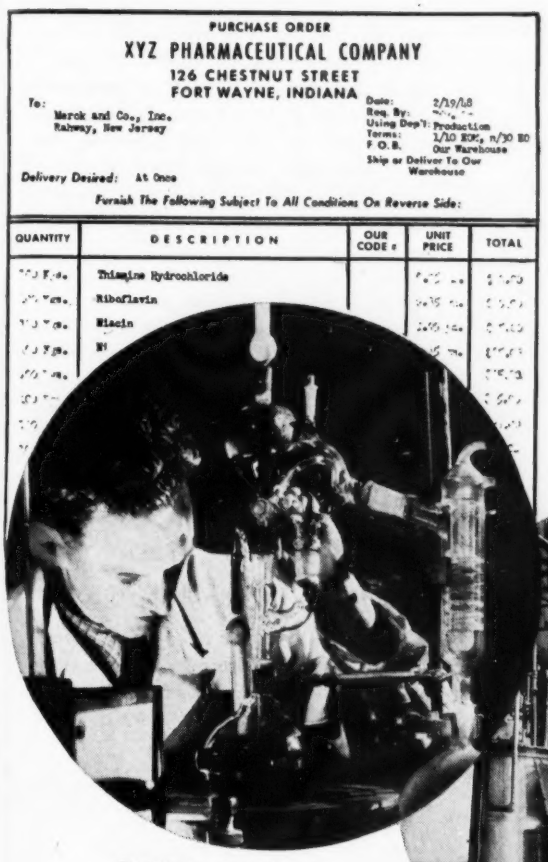
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(*Continued on page 493*)


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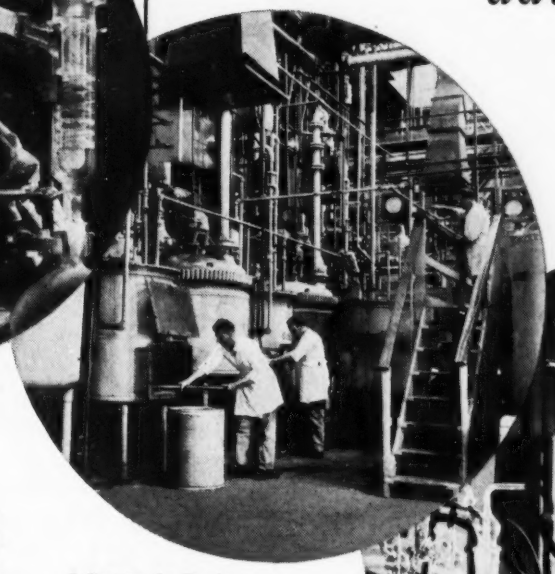
Furnish The Following Subject To All Conditions On Reverse Side:

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[illegible]	Riboflavin		[illegible]	[illegible]
[illegible]	Niacin		[illegible]	[illegible]
[illegible]	[illegible]		[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]

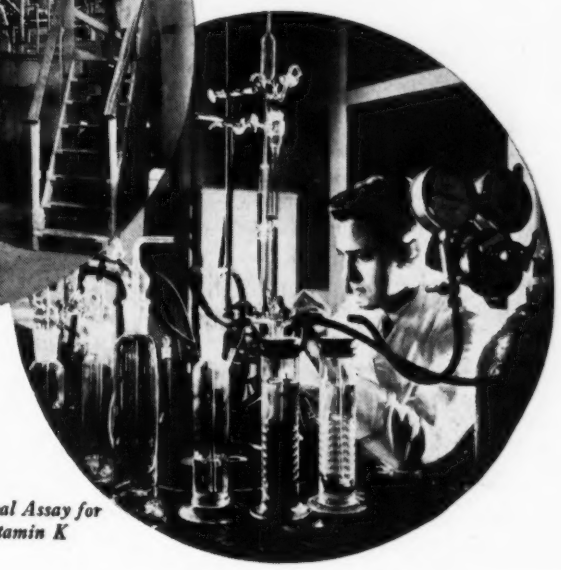
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Alpha Tocopherol
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★ ★ ★

Choline

We will be pleased to quote on your requirements.

MERCK VITAMINS

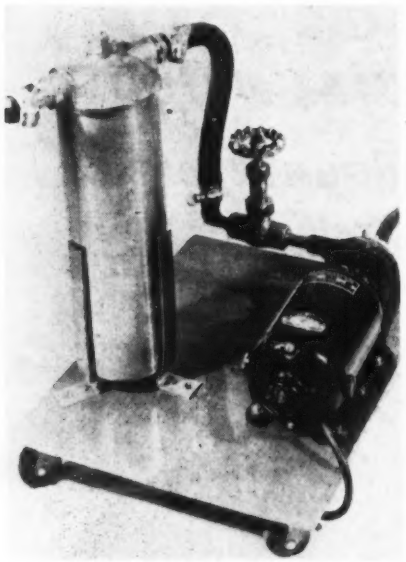
MERCK & CO., Inc. RAHWAY, N. J.

Manufacturing Chemists

NEW EQUIPMENT

Small Filter QB 606

The Sethco filter unit is constructed of stainless steel throughout and is suitable



for filtering all the common plating baths. 20,000 to 40,000 gal. of solution can be filtered through each filter tube before it needs changing. The unit comes complete with motor, pump and filter and weighs 30 lbs. The filter tube is made of specially processed cotton yarn wound around a stainless steel core and requires no filter aids to remove even colloidal particles.

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A turbo dryer for continuous operation which can be used either experimentally, for pilot plant operation or actual production is offered by the Wyssmont Co. The capacity of this unit ranges between 1,000 to 10,000 lbs. of dried material per day and is suitable for handling a variety of materials ranging from granular material to pastes and thick slurries. Because of its dustless operation it is suited for materials which dry to a fine powder.

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The standard units are offered with the tray system of steel and transite, aluminum or stainless. Fin type and smooth surface steam heating elements are available. Electrical heaters can also be supplied. These units, by virtue of their totally enclosed construction, can be incorporated in a closed system.

Rubber Lined Valve QB 608

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The venturi body design of the valve insures negligible pressure drop, straight line throttling and high coefficient of discharge (95 to 99%). The cast iron body, flanges, and all working parts are covered with hard rubber. The valve is double seated; it may be installed in any position in the line; should seat wear occur, the body may be turned end from end to utilize the other seat. The valves are available up to 4" and handle 150 psi.

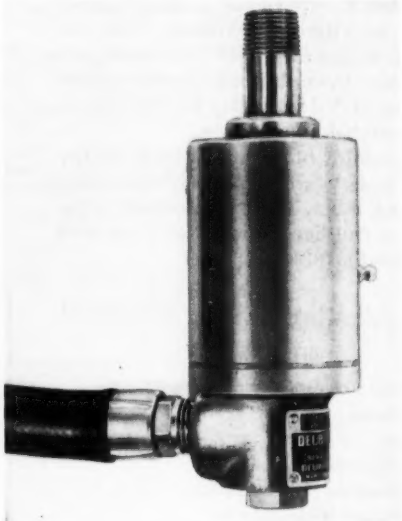
Pipe-Fitting Covers QB 609

Pre-formed Foamglas pipe-fitting covers of the Pittsburgh Corning Corp. are suitable for fields where exact temperature control is required, whether heat is to be retained or excluded.

The covers, being manufactured in all sizes for Ls, Ts, unions, valves, elbows and flange covers are waterproof, vaporproof, fire retardant and resistant to fumes. They may be used through temperature ranges from −200° to 800° F.

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QB609	QB613	QB617	QB621	QB625	QB629	

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Company.....

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City..... Zone..... State.....



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Smilin' Tex says:

"IT AIN'T BRAGGIN' IF YOU CAN PROVE IT"



If you ever drink the water of the Texas Coast country we'll lay money you'll come back

That's an old expression down here in Texas. Reason it came to be was because all the drinking water was so pure and good that every town thought it had the best.

And there will never be a shortage of industrial water because the rivers that flow across the coastal plains of Texas afford a more than adequate source.

But plenty of water is but one reason why you should locate, relocate or expand your chemical plant to the Texas Gulf Coast.

Here are some more "come-on" reasons: down here there is a superabundance of sulphur, salt and hydrocarbons — the basic materials upon which the chemical industry thrives.

Natural gas is the cleanest, most economical fuel and Texas has 58% of the U. S. known reserve.

Unexcelled transportation facilities — land, water, air; no sales tax, no State income tax; cooperative, intelligent labor; sunshine; plenty of room for factory and home.

For a new chemical site, the Texas Gulf Coast is your best bet.

Send for a Survey of the Texas Coast country. On request, we will prepare for your company a carefully engineered and confidential survey of the Texas Coast Country individualized to fit your particular problem. No cost, no obligation. Address Research Department. Houston Pipe Line Co., Houston, Texas.

HOUSTON PIPE LINE CO.

Subsidiary of Houston Oil Company of Texas

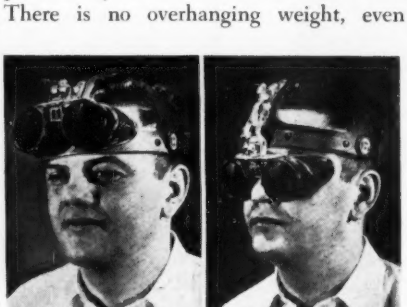
GEO. A. HILL, JR., President

Wholesalers of Natural GAS

the union. Double row ball bearing and concentricity of threads in relation to the bearing surfaces assures non-wobbling performance. Available sizes: ½", ¾", 1" and 1½".

Safety Goggle QB 611

A new head-rest safety goggle is being produced by American Optical Co. Based on a new spring mechanism, the goggle can be instantly thrown into "off-guard" position by a mere flick of the wrist. There is no overhanging weight, even



when the goggle is in the "off-guard" position. Adjustment to facial contours and correct pupillary distances can be made instantaneously without tools.

The Duraweld Coverglas goggle that comes with the new development protects eyes against injurious light radiations, glare, flying sparks and scale. It may be worn directly over the eyes or personal prescription glasses. The fibre headgear fits comfortably and is adjusted to any head size by a nut turning on a right and left-hand threaded stud.

Waste Treater QB 612

Infilco Inc. has developed a new apparatus, known as the "Cyclator," for the treatment of paper mill white waters and other industrial wastes.

The process is particularly adaptable to treatment of wastes which contain voluminous and slow settling solids.

In the mixing zone wastes and chemicals are added in the presence of existing solids to which the newly formed precipitates will adhere. Recycling previously precipitated solids coagulates in the presence of a thick slurry with a consistency of about ½% and in the presence of a volume that is at least twice that of the wastes undergoing treatment.

A variable speed circulator lifts the coagulated mixture into the circulating zones, which consist of two concentric sections with an upward flow in the inner section and a downward flow in the outer. Flow then passes into the clarification zone where precipitates are settled out and clarified water is withdrawn at the surface. The entire outer area of the basin is a relatively quiescent zone in which the precipitated solids settle. The solids are then thickened as they are moved to a collection sump by the rotating scraper.

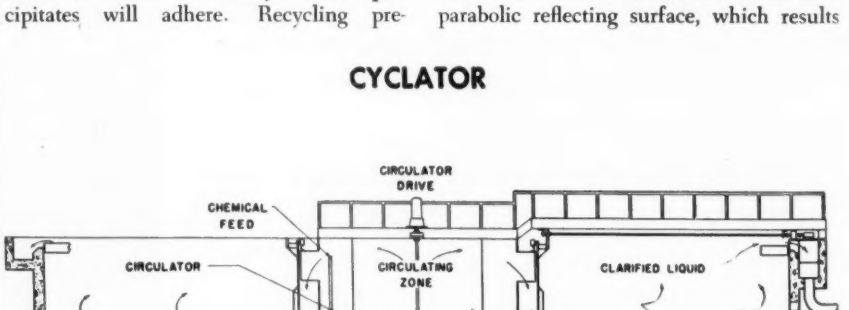
Smoke Density Recorder QB 613

Bailey Meter Co. has developed a new electronically-operated smoke density recorder which proves compliance with smoke ordinances and under certain conditions gives the first warning of faulty combustion conditions in furnaces. It consists of a standard electronic recorder, a bolometer type smoke detector and a sealed beam light source. The amount of radiation reaching the filament is dependent upon the density of the smoke or dust; and the temperature of the filament is dependent upon the amount of radiation reaching it. The filament temperature is measured by the electronic recorder in terms of smoke density. A temperature compensating circuit eliminates errors due to high ambient temperatures, and is unaffected by normal voltage variations. The bolometer construction resists the usual corrosive vapors found in flues.

Radiant Heater QB 614

For drying, baking, preheating and dehydrating where a longer-wave infrared heat source is desired, the Edwin L. Wiegand Co. manufactures the new Chromalox electric heater. The heating elements are mounted at the focus of a parabolic reflecting surface, which results

CYCLATOR





Modern process technology requires varied materials to meet varied requirements. With Ceraware, Cerawite and Impervite, General Ceramics meets successfully the Industry's demand for all types of corrosion-proof and thermal shock resisting equipment. By providing all these material types from one source of supply, users get more than the inherent product advantages. Here are a few:

- UNIFORMITY OF STRUCTURE
- GUARANTEED FITTING OF ALL UNITS
- REDUCED PAPER WORK
- REDUCED ACCOUNTING
- LOWER SHIPPING COSTS THROUGH CONSOLIDATION OF ORDERS SPECIAL EQUIPMENT CAN BE CONSTRUCTED IN ALL THREE TYPES

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in a maximum heat radiation uniformly distributed over the surface to be heated. A negligible amount of visible light is produced from the Inconel-sheathed tubular electric heating unit which operates at temperatures of 1000° to 1400° F.

Interlocking and sliding bolt features permit maximum flexibility in fabricating groups of heaters into patterns – arcs, circles, squares, etc. Adjacent sections can be interlocked on a plane or, by means of hinge-acting joints, can be rotated up to 25°. Standard body lengths are 25", 31" and 47", with respective elements 17", 23" and 39"; standard height is 4". Various wattages can be provided.

Selector Controller QB 615

An addition to the line of the Foxboro Co. is an instrument which controls, selectively, from either of two related variables, by positioning a single valve, damper, or other operator. This selection is determined by the variable having the greater tendency to exceed its pre-set limit. The Auto-Selector may incorporate the automatic reset function in the control of either or both variables. The design of the instrument embodies two measuring systems and two inter-connected control mechanisms which may act on-off, proportional, proportional with derivative, proportional with reset, proportional with reset and derivative or any combination of these.

A typical application is in a pipeline pumping station, where it controls either the discharge pressure or the suction pressure of the pump, in accordance with supply and demand requirements. It is not necessary that the controlling measurements be of like variables. Any two that are related may be combined, such as outlet temperature and steam pressure in a heat-exchanger, or temperature and flow of brine in a cooler. The controller is available as a recorder or indicator.

Non-Frosting Gage QB 616

Jerguson Gage & Valve Co. has a new flat glass non-frosting gage, for low temperature fluids which can be made in any material to suit operating conditions. The gage is built with a transparent frost-preventing unit, sealed to the gage glass, that projects beyond the cover bolts so frost cannot build up across the vision slot in the cover forging. It is available in both reflex and transparent types.

Air Driven Pump QB 617

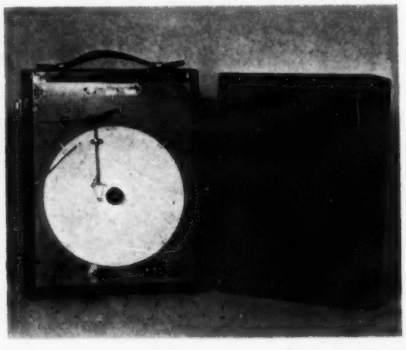
For use where electric power is not available a new chemical pump, in simplex and duplex models, powered by a 1 hp. rotary air motor, is being offered by the Milton Roy Co. This "Airometric" Pump is operated by natural gas or compressed air as the prime mover, at air pressures from 50 to 80 psi. A maximum motor speed is 1750 rpm, held constant by a governor which throttles the air exhaust from the motor. Drive is through a speed reduction unit. The motor and mechanical system are balanced by means of a fly-wheel fixed to the motor coupling.

Maximum pumping capacities are (simplex) from 1.2 to 75.5 gph., (duplex) from 2.4 to 151 gph. Maximum discharge pressures range from 115 to 9500 psi. Available in iron, steel and alloy metals, the pumps are metering units affording precise control of liquid pumped to as little as 1 pint per hour.

Magnesium Anode QB 618

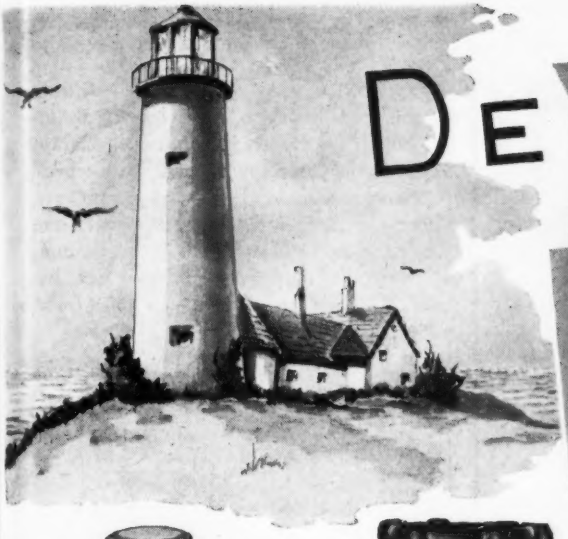
A means of cathodic protection is Galvo-Line, a magnesium ribbon anode which has been developed by the Dow Chemical Co. for protecting buried metal structures from corrosion. The anode has a cross section of ⅜" by ¾" and contains a centrally located core of iron wire to facilitate making permanent electrical connections and prevent possible segregation. It is designed for use primarily in high resistivity soils where cast anodes may not be practical because of their low current output. Standard lengths are 1,000, 2,000 and 5,000 feet.

• QB 619 The Wallace and Tiernan *portable DC recorder* for the measurement of micro currents and voltages



wherein the required range may be selected has a minimum full scale range of 0 to 0.1 milliamp., a maximum of 0 to 12 amp. Sensitivity is 1 part in 1000. The recorder is of the moving magnet, interchangeable coil type and is designed for continuous duty. Bearing friction and friction between the pen and chart are virtually eliminated. Eight different coils are available and each is adjustable over a range of 11.5 to 1. The zero on the scale can be suppressed up to 80%. The circular 24 hr. chart is driven by a 5 watt synchronous motor.

• QB 620 A new lone of machines of Pittsburg Lectrodryer Corp. for *drying instrument air* has fully automatic reactivation, cooling and reversal of the machines' dual adsorber towers. The dryers will be built as standard for op-



DEPENDABLE VALVES

to safeguard *flow control services* in all industries

Just as mariners depend on lighthouses to safeguard their ships, so the men of industry depend on their flow control equipment to safeguard their manufacturing plants from "going on the rocks" of costly shut-downs.

With a background of more than a century of making valves—and valves only—Powell Engineers know how to make a valve dependable.

And because the Powell Line is so *complete*, there are Powell Valves—in Bronze, Iron, Steel, and the widest range of Corrosion-resistant materials ever used in making valves—specifically designed and made to give long, dependable performance in each and every flow control service known today.

It pays to consult Powell Engineers on all your requirements for flow control equipment.

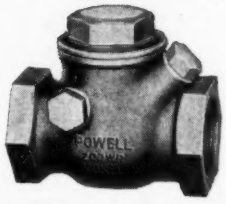


Fig. 1843 — 200-pound Monel Metal Swing Check Valve with screwed ends, screwed-in cap.

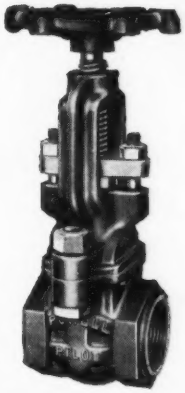


Fig. 480—All Iron "Pilot" Gate Valve with screwed ends, bolted flanged yoke, outside screw rising stem and tapered solid wedge.



Fig. 1816—Large 125-pound All Iron Gate Valve. Made in sizes 2" to 30", incl. Has bolted flanged yoke, outside screw rising stem and tapered solid wedge.

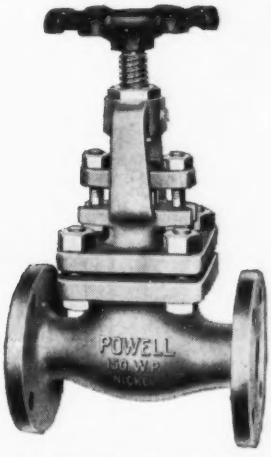


Fig. 1969-NI—150-pound Nickel Gate Valve with flanged ends, bolted flanged yoke-bonnet and outside screw rising stem.

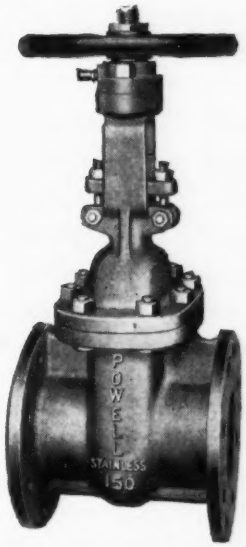


Fig. 2453-G—150-pound Stainless Steel Gate Valve with bolted flanged yoke-bonnet, outside screw rising stem and tapered solid wedge.

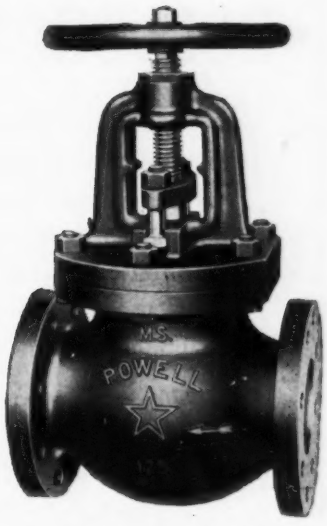


Fig. 457—125-pound All Iron Globe Valve with outside screw rising stem, bolted flanged yoke and regrindable renewable iron seat and disc.

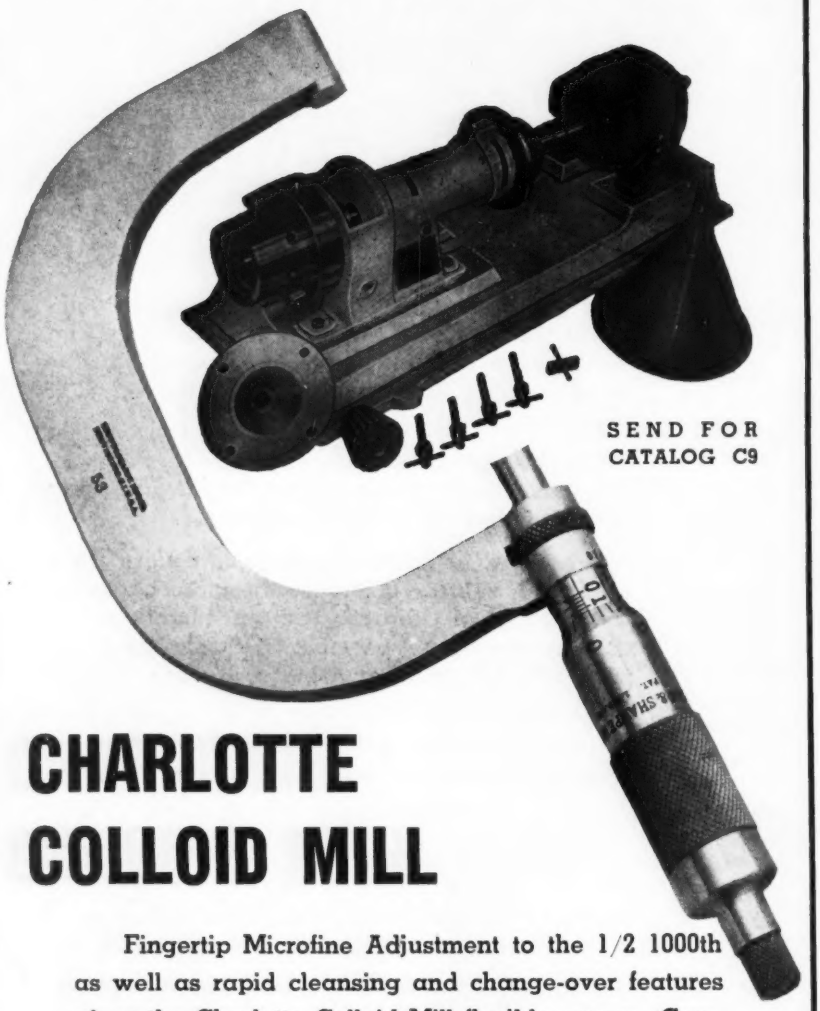
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Fingertip Microfine Adjustment to the 1/2 1000th as well as rapid cleansing and change-over features gives the Charlotte Colloid Mill flexible usage. Combine these features with absolute uniformity of product, better plant control, and considerable savings in floor space; and you can eliminate much of old-fashioned bulky equipment used heretofore.

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eration on pressures up to 150 psig for either steam of electric reactivation.

• QB 621 A new *thermoplastic matting* for use in industry, made by the B. F. Goodrich Co., has high abrasion resistance and proves especially valuable in applications where acids or oils are present, resisting these agents which are usually destructive to rubber. Made in black and brown, the matting is 3/32" thick by 36" wide and is supplied in rolls from 25 to 35 yds.

• QB 622 A new ballast type *reducing valve* is offered by Hoke Inc. Higher delivery pressure with better degree of



regulation can be obtained because the force of gas pressure is used to regulate the delivery pressure. Pressure is governed by admitting gas into a ballast chamber above the diaphragm until the desired figure is reached. Pressure is lowered by releasing gas from the ballast chamber into the discharge side of the regulator.

The regulator body and ballast chamber are constructed of brass while the regulator seat pin and needle valve spindles are of stainless steel. Delivery pressures beyond 2000 psi and inlet pressures beyond 2800 psi may be obtained and used by substituting different pressure gages.

• QB 623 In operation, the closing of a normally open supervisory or "trouble" contact—in a thermal unit to indicate high bearing temperature, for example—closes the control relay of the appropriate Autocall Annunciator designation. Closing of this relay causes illumination of the lamp behind the designation and souding of a remote audible alarm which continues to sound until the signal is acknowledged by momentarily pressing a common silencing switch mounted separately from the Annunciator. Operation of this switch for one acknowledgment, however, does not prevent the functioning of the audible alarm in the event of subsequent "trouble" contact closure.

• QB 624 The new Ward Leonard Electric Co. *A C Magnetic Starters* for nonreversing, across-the-line starting of polyphase squirrel cage induction motors and

Eliminate THE EXTRA STEP

Cut MIXING COSTS 20% or more

One way to reduce material handling costs is to eliminate the extra step of emptying drums into mixing units.

Wherever mixing can be performed by revolving or tumbling the container, "U. S." Drum Mixing equipment can save you time and money.

"U. S." Drum Mixing equipment permits mixing in your own or supplier's drums . . . avoids the costly delays from emptying and cleaning fixed containers . . . eliminates danger of contamination.

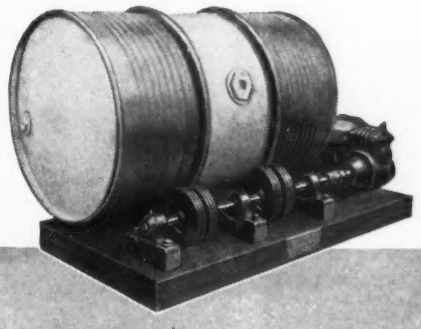
See them at the show

Be sure to visit Booths 40, 41, 42, National Chemical Exposition, Chicago, October 12-13-14-15-16.

DRUM ROLLERS

"U. S." Adjustable Drum Rollers will roll any round container from a one-gallon pail to a 70-gallon drum. Eight heavy-duty rubber wheels are adjustable to provide ample clearance for rolling hoops and bung openings. Powerful, heavy-duty motor will roll loads up to 1,000 lbs. "U. S." Drum Rollers are built in sizes to handle one, two, three, or four drums, constant or variable speed drive.

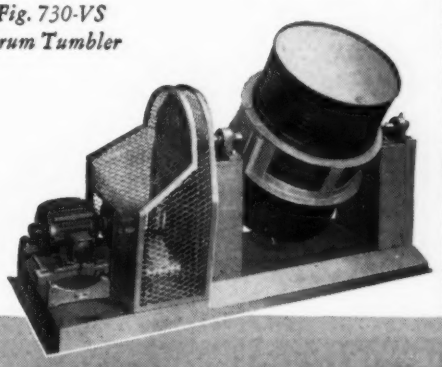
Fig. 745-S
Drum Roller



DRUM TUMBLERS

"U. S." Drum Tumblers are built in two sizes: single and double drum units to handle standard 55-gallon drums. Units to handle 30- or 70-gallon drums are available on special making order. Variable speed drive permits tumbling speeds from 8 to 21 RPM. Powerful, heavy-duty motor will handle loads up to 1,000 lbs. Adjustable yoke opens quickly and easily, locks securely.

Fig. 730-VS
Drum Tumbler



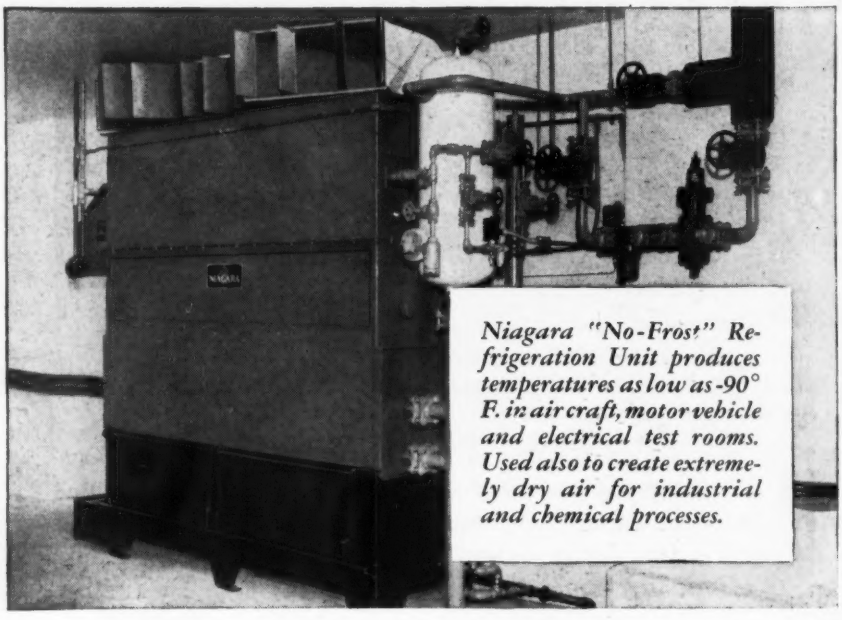
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• A controlled atmosphere may be a particular gas, inert or reactive, or it may be air under controlled conditions of purity, temperature or moisture content. Its purpose is to further production or prevent loss of material or product, or to make a uniform and better product.

This Company has worked for many years among such problems and has developed special apparatus that has helped many industrial leaders to improve their manufacturing.

Always, there is a problem of moisture and temperature, whether it may be a special gas atmosphere for heat treating, or air under most precise specifications for a process with hygroscopic materials, or a "cold test" room at -90° F.

Niagara Units for industrial air and gas conditioning make it easier for you to find equipment that will produce the conditions you need with both installation and operating economy.

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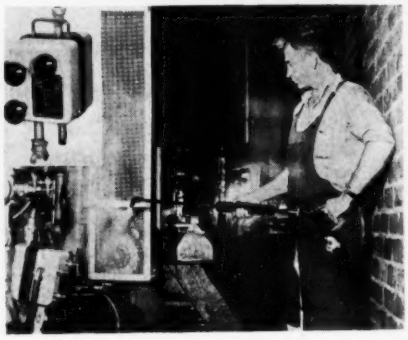
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single phase motors are designed in accordance with Underwriters' Laboratories, Inc. and NEMA standards for industrial control. They are suitable for use with separate pilot devices for 2 or 3 wire remote control, or can be supplied with local control pushbutton stations or selector switches. The starters feature: compact unit construction; high arc interruption capacity; fast, positive and consistant operation; reliable thermal overload protection. They have a maximum enclosed rating of 7½ H.P., 440-550 volts, three phase, 60 cycles.

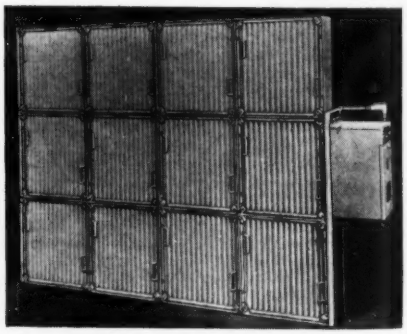
• QB 625 Turco Products has made available an improved *steam cleaning unit* which utilizes steam to supply the proper



amount of cleaning solution in a regulated flow where it is mixed and delivered through a single hose to the cleaning gun.

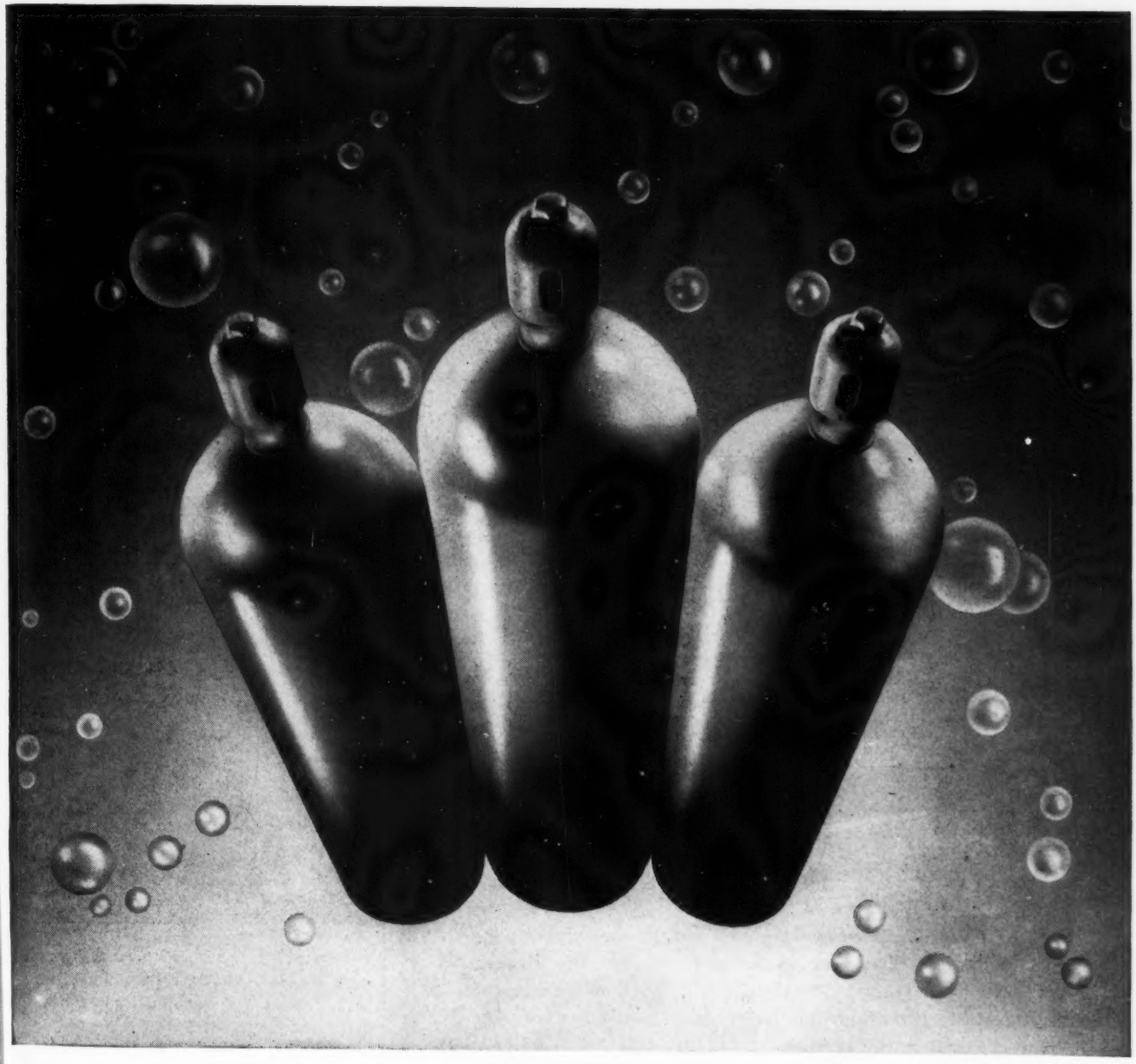
• QB 626 A new small space, alternating current *solenoid* developed by B/W Controller Corp. is intended for heavy duty service on valves located where ambient temperatures are extremely high, such as near boilers.

• QB 627 An *electronic air filter,* the Electro-PL, has been developed by American Air Filter Co., with an intermediate cleaning efficiency for applications where the efficiency of a mechanical filter is too low and that of an electronic preciptator is unnecessarily high. The new filter



is basically an electronic precipitator without an ionizing unit and contains a collector element of electrostatically charged paper.

This paper is a laminated cellulose product composed of a number of plies of porous, tissue-like sheets of short



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Hackney Cylinders are comparatively light in weight—to assure shipping and handling economies. They're strong, too—to give utmost protection. The Hackney Deep Drawing Process gives them both these desirable qualities—as it assures uniform sidewall thickness and eliminates all excess material. Then, too, the physical qualities are still further improved after complete fabrication by a special heat-treating method. For further details on this strong, lightweight cylinder, write us.

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***Truitt's* engineering service in the fabrication of carbon and stainless steel is available to the textile, chemical, pulp and other industries. Should your need be tanks, vats or other equipment, remember . . . . *Truitt*, one of the South's larger fabricators, will gladly figure your job, without cost or obligation.**

TRUITT

MANUFACTURING COMPANY

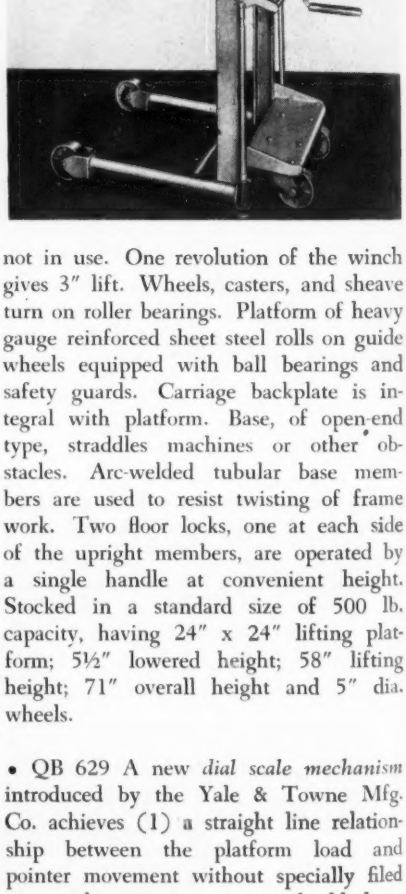
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Fabricators of Solid Stainless Steel and Stainless-Clad Tanks • Dyeing Vats • Washing Tanks • Steam Drums • Storage Tanks for Acids and Alkalis • Mechanical Agitators • Separators • Stainless Steel Trucks • And Many Other Stainless Steel Products.

fibres in "jack-straw" arrangement and is also used in mechanical filters. When an electrostatic charge is applied to the paper, the plies tend to separate and each individual fibre becomes a collecting electrode which attracts and holds dust and smoke particles.

The unit will continue to function when deenergized as a dry-type air filter.

• QB 628 The new CH Handy Hoister, a light-weight *stacker* of Lewis-Shepard products has crank-up-crank-down operation through a planetary gear drive winch to permit placing and holding platform at any level. Winch handle cannot spin or get away from operator when lowering load, and swings out of the way when



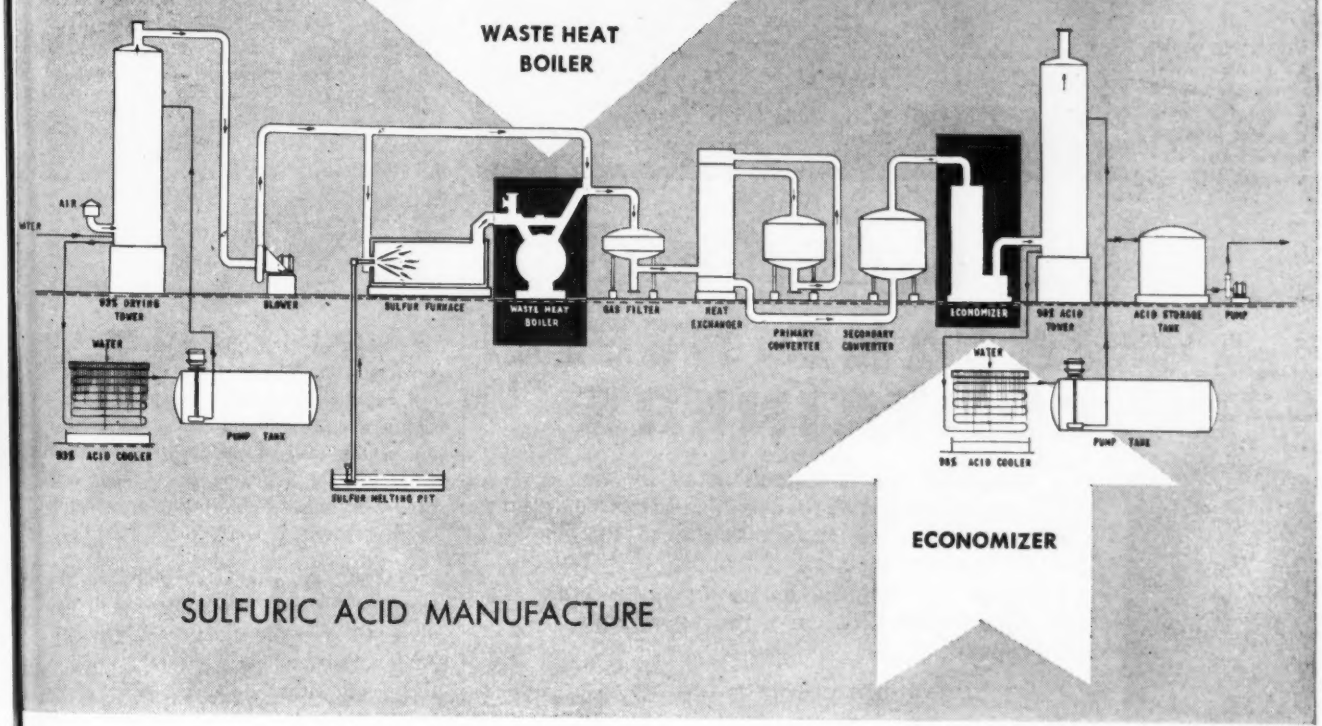
not in use. One revolution of the winch gives 3″ lift. Wheels, casters, and sheave turn on roller bearings. Platform of heavy gauge reinforced sheet steel rolls on guide wheels equipped with ball bearings and safety guards. Carriage backplate is integral with platform. Base, of open-end type, straddles machines or other obstacles. Arc-welded tubular base members are used to resist twisting of frame work. Two floor locks, one at each side of the upright members, are operated by a single handle at convenient height. Stocked in a standard size of 500 lb. capacity, having 24″ x 24″ lifting platform; 5½″ lowered height; 58″ lifting height; 71″ overall height and 5″ dia. wheels.

• QB 629 A new *dial scale mechanism* introduced by the Yale & Towne Mfg. Co. achieves (1) a straight line relationship between the platform load and pointer movement without specially filed cams, adaptations to prevent backlash or delicate adjustments of the angular relationships between sectors, (2) a reduction of service adjustments from the usual six or seven to only two and (3) full but light engagement between the pointer

Heat Recovery

...an extra saving in

CHEMICO CONTACT ACID PLANTS



SULFURIC ACID MANUFACTURE

Chemico pioneered in the recovery of heat resulting from the combustion of sulfur and from the conversion of SO_2 to SO_3 in contact acid plants. Converting this heat to high pressure steam in waste heat boilers and economizers makes these benefits available:

- ***Economy of operation. Recovered heat premelts the sulfur . . . steam replaces electric power for driving machinery, and heats the buildings in cold weather.***
- ***Combustion gases are cooled to suitable temperatures for conversion.***
- ***The need for a separate supply of steam is eliminated.***

Chemico Plants are profitable investments

CHEMICAL CONSTRUCTION CORPORATION

EMPIRE STATE BLDG., 350 FIFTH AVENUE, NEW YORK 1, N. Y.

EUROPEAN TECHNICAL REPRESENTATIVE

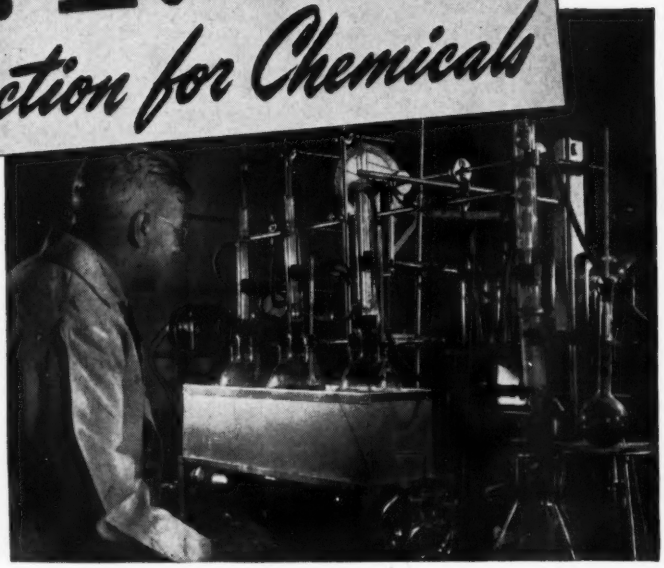
CYANAMID PRODUCTS, LTD., BRETTENHAM HOUSE, LANCASTER PLACE, LONDON W. C. 2, ENGLAND

CABLES: CHEMICONST, NEW YORK

CC 168

T.F.P.*

Protection for Chemicals



Laboratory at the Chicago plant where Steri-Seald Linings for many chemical products have been developed.

. . . WITH Steri Seald LINED

INLAND STEEL CONTAINERS

Lever locking ring drum—easy to open and reseal air tight.



Our laboratory has developed many interior coatings for steel containers that enable us to offer to the chemical industry a perfect container for many, difficult to pack, chemicals.

Our Steri-Seald lining laboratory is available to help you solve the problem of packaging your chemical products.

***Trouble Free Packaging**

Lever locking ring pail—can be re-sealed, tight.



New Por-Pail lug cover with pouring spout—ideal for liquids.



No. 8 Lug cover pail.

INLAND STEEL CONTAINER CO.

Container Specialists

6532 SOUTH MENARD AVE., CHICAGO 38, ILLINOIS

PLANTS AT: CHICAGO—NEW ORLEANS—JERSEY CITY

rack and pinion by means of a permanent magnet.

The capacity of the mechanism under direct loading without any lever system is 25 lbs.; its application to large industrial loads, up to 50 tons is a matter of lever linkage. The dial head can be swiveled through 360°.

• QB 630 A method of applying electro-magnetic vibration to a bowl container to produce a circular traveling and climb-



ing motion of small pieces, parts, or bulk powders is embodied in the *vibratory vertical bowl feeder* of the Syntron Co. By having a grooved track ramp up the inside of the wall of the bowl these small pieces can be fed one at a time with speed and starting and stopping of flow readily controlled.

• QB 631 A new *hand truck* of the American Pulley Co. for drums and barrels stands vertically, entirely unsupported. Other advantages are:

1. Truck rides on wheels right up to drum when preparing to load. No "jockeying" or "inching" up to drum.
2. Hinged wheels make it possible for loaded truck to stand in semi-upright position—adequately supported at four points for greater safety.
3. Full weight of load is carried over strong pressed-steel rubber-tread wheels. Operator easily balances load—does not carry it. The load is supported at four points to increase stability and safety.

• QB 632 The Temprite Products *cooler* which measures 14" in dia. by 54" high, is based on the "flooded" cooling principle. Water coils are submerged in the liquid refrigerant itself and the heat of the water being used passes directly into the main body of the refrigerant.

The cooler will deliver 1185 gals. of 40° water per hr. assuming a 60° inlet temperature or 675 gals. per hr. assuming an 80° inlet temperature.

Equipment Manufacturers Addresses

(Continued from page 478)

Flodar Corp.
331 Frankfort Ave.
Cleveland, Ohio

Foxboro Co.
Foxboro, Mass.

Gar-Bro Mfg. Co.
2416 E. 16th St.
Los Angeles 21, Cal.

General American Transportation Co.
10 East 49 St.
New York 17, N. Y.

General Ceramics & Steatite Corp.
Chemical Equipment Division
Keasbey, N. J.

General Controls Co.
801 Allen Avenue
Glendale 1, Cal.

General Electric Co.
1 River Road
Schenectady 5, N. Y.

G. M. Giannini & Co.
285 N. Colorado St.
Pasadena, Cal.

Globe Steel Tubes Co.
3839 West Burnham St.
Milwaukee 4, Wis.

B. F. Goodrich Co.
342 Rose Bldg.
Cleveland 15, Ohio

Gotham Instrument Co., Inc.
149 Wooster St.
New York 2, N. Y.

Goulds Pumps, Inc.
Seneca Falls, N. Y.

Gow-Mac Instrument Co.
22 Lawrence St.
Newark 5, N. J.

Grace Products Co.
P.O. Box 2466
Birmingham, Ala.

Graff Engineering & Equipment Co.
Louisville, Ky.

Great Western Mfg. Co.
Leavenworth, Kansas

J. W. Greer Co.
119 Windsor St.
Cambridge 39, Mass.

Groen Mfg. Co.
4535 Armitage Ave.
Chicago 39, Ill.

Grove Regulator Co.
6529 Hollis St.
Oakland 8, Cal.

Guernet Electrical Machinery, Inc.
Box 196
Meriden, Conn.

Geo. Haiss Mfg. Co.
141st-144th St. on Park Ave.
New York 51, N. Y.

Hammel-Dahl Co.
243 Richmond St.
Providence 3, R. I.

Hanson Mfg. Co.
Cleveland, Ohio

Hapman Conveyors, Inc.
2405 W. McNichols Road
Detroit 21, Mich.

James K. Harbinson & Co.
408 Root Bldg.
70 W. Chippewa St.
Buffalo, N. Y.

Hastings Instrument Co.
P. O. Box 1275
Hampton, Va.

Heil Process Equipment Co.
12901 Elmwood Ave.
Cleveland 11, Ohio

Hercules Filter Corp.
204-208 21st Ave.
Paterson, N. J.

Hewitt-Robins, Inc.
Robins Conveyor Division
270 Passaic Ave.
Passaic, N. J.

Homer Mfg. Co.
Lima, Ohio

K. H. Huppert Co.
6830 Cottage Grove Ave.
Chicago 37, Ill.

Illinois Testing Laboratories
420 N. LaSalle St.
Chicago 10, Ill.

Industrial Development Laboratories
223-233 W. Erie St.
Chicago, Ill.

Industrial Instruments, Inc.
17 Pollock Avenue
Jersey City 5, N. J.

Industrial Process Engineers
5204 Hudson Ave.
West New York, N. J.

Infilco, Inc.
325 West 25 Place
Chicago 16, Ill.

Irvington Varnish & Insulator Co.
6 Argyle Terrace
Irvington 11, N. J.

Jabsco Pump Co.
2031 North Lincoln St.
Burbank, Cal.

J-B-T Instruments, Inc.
441 Chapel St.
New Haven 8, Conn.

Jeffrey Mfg. Co.
Columbus 16, Ohio

Jerguson Gage & Valve Co.
87 Fellsway
Somerville, Mass.

Johnson Corp.
Three Rivers, Mich.

E. D. Jones & Sons Co.
Pittsfield, Mass.

Joy Mfg. Co.
Henry West Oliver Bldg.
Pittsburgh 22, Pa.

Justrite Mfg. Co.
2051 N. Southport Ave.
Chicago 14, Ill.

Kato Engineering Co.
Mankato, Minn.

Kinney Mfg. Co.
3529 Washington St.
Boston 30, Mass.

Kirk & Blum Mfg. Co.
2839 Spring Grove Ave.
Cincinnati 25, Ohio

K & K Engineering Co.
Bolton, N. Y.

Knapp Mills, Inc.
121 Broad St.
New York 4, N. Y.

Koppers Co., Inc.
Pittsburgh 19, Pa.

Ladish Co.
Cudahy, Wis.

Lake Chemical Co.
607 N. Western Ave.
Chicago, Ill.

Leeds & Northrup Co.
4901 Steaton Ave.
Philadelphia 44, Pa.

Lennan Lights, Inc.
231 W. Olive Ave.
Burbank, Cal.

Leslie Co.
69 Delafield Ave.
Lyndhurst, N. J.

Lewis-Shepard Products, Inc.
328 Walnut St.
Watertown 72, Mass.

Lindberg Engineering Co.
2450 W. Nabbard St.
Chicago 12, Ill.

Link-Belt Co.
307 N. Michigan Ave.
Chicago 1, Ill.

Liquid Conditioning Corp.
114 E. Price St.
Linden, N. J.

Lunkenheimer Co.
Beekman St. & Waverly Ave.
Cincinnati, Ohio

Lyon-Raymond Corp.
4243 Madison St.
Greene, N. Y.

Macbeth Corp.
227 W. 17th St.
New York 11, N. Y.

Manning, Maxwell & Moore, Inc.
Bridgeport 2, Conn.

Marco Co., Inc.
3rd & Church Sts.
Wilmington 50, Del.

Glenn A. Marsh
6059 Waveland Ave.
Chicago, 34, Ill.

Jas. P. Marsh Corp.
2073 Southport Ave.
Chicago 14, Ill.

Material Movement Industries, Inc.
9257 Laramie Ave.
Skakie, Ill.

Merco Centrifugal Co.
582 Market St.
San Francisco 4, Cal.

Metal-Glass Products Co.
Belding, Mich.

Metron Instrument Co.
432 Lincoln St.
Denver 9, Col.

Metzgar Co.
412 Douglas, N.W.
Grand Rapids, Mich.

Michigan Wire Cloth Co.
2100 Howard St.
Detroit 16, Mich.

Micro Metallic Corp.
193 Bradford St.
Brooklyn 7, N. Y.

Milton Roy Pumps Co.
1300 E. Mermaid Ave.
Philadelphia 18, Pa.

Mine Safety Appliances Co.
Braddock, Thomas & Meade Sts.
Pittsburgh 8, Pa.

Mission Mfg. Co.
Houston, Texas

Mitts & Merrill
Saginaw, Mich.

Modern Equipment Co.
2007-11 Cuming St.
Omaha 2, Neb.

Moore Products Co.
H & Lycoming Sts.
Philadelphia 24, Pa.

Morris Machine Works
Baldwinsville, N. Y.

Morse Mfg. Co.
122 Dickerson St.
Syracuse 2, N. Y.

Mosher Electronic Controls
130 W. 42nd St.
New York 18, N. Y.

Nagle Pumps
Chicago Heights, Ill.

National Scale Co.
43 Mill St.
Springfield, Mass.

National Technical Laboratories
820 Mission St.
South Pasadena, Cal.

New England Tank & Tower Co.
85 Tileston St.
Everett, Mass.

Niagara Blower Co.
405 Lexington Ave.
New York 17, N. Y.

Niagara Filter Co.
3080 Main St.
Buffalo 14, N. Y.

Nordberg Mfg. Co.
Chase & Oklahoma Aves.
Milwaukee 7, Wis.

Northern Indiana Brass Co.
Elkhart, Ind.

Nutmeg Industries
45 Deacon St.
Bridgeport, Conn.

John T. O'Connor & Co.
196 S. Valley Road
West Orange, N. J.

Ohio Injector Co.
Wadsworth, Ohio

Owen-Corning Fiberglas Corp.
Toledo 1, Ohio

Palmer-Shile Co.
16040 Fullerton Ave.
Detroit 27, Mich.

Palo-Myers, Inc.
81 Reade St.
New York 7, N. Y.

Parker Appliance Corp.
17325 Euclid Ave.
Cleveland 12, Ohio

Patron Transmission Co.
129 Grand St.
New York 13, N. Y.

Paul Valve Corp.
683 Third Ave.
New York, N. Y.

(Continued on page 542)

PACKAGING & SHIPPING

by T. PAT CALLAHAN

Steel Barge for Sulphuric Acid Launched

A new barge especially designed to transport sulphuric acid on the Intracoastal Waterway is pictured below just after launching at the Neville Island shipyard of Dravo Corp., Pittsburgh, Pa. The 175-foot vessel, built for Consolidated Chemical Industries, Inc., Houston, Texas, will enable an increase in marine deliveries of sulphuric acid to plants in the chemical and oil industries along the waterway route covering Texas, Louisiana, Mississippi, Alabama and Florida.

Design of the welded steel barge is based on a study of the various problems in carrying sulphuric acid on inland waterways. Although acids of various kinds now are transported by barge, many of the vessels used are ordinary hopper barges converted by installation of tanks.

In the new barge, concentrated sulphuric acid will be carried in two cylindrical steel tanks, each 8½ feet in diameter and 135 feet long, running parallel the length of the hold. Their combined capacity is about 865 short tons of acid. The tanks are strapped in cradles formed of 2-inch thick treated hardwood blocks on steel supports, and are sealed under pressure during voyages.

Since concentrated sulphuric acid becomes extremely corrosive when diluted with water, the barge is decked over with steel to make the hold watertight. Two special pumps, manufactured by the Charles D. Lewis Co., St. Louis, Mo., are installed on the barge deck in midbody for discharging the acid.

Fulton Bag & Cotton Buys L. A. Plant

The Fulton Bag & Cotton Mills, Atlanta, Georgia, has purchased the bag business of West Coast Bags, Inc., Los Angeles, California. The tremendous growth in population, agriculture, and industry on the West Coast made it important that Fulton provide better service facilities for its growing group of customers in the Coast area.

Jack C. Baldwin, who has been president and manager of West Coast Bags, will continue as manager of this Los Angeles plant, and the organization will be maintained largely with its present personnel.

MCA Offers Manual On Calcium Carbide

The Manufacturing Chemists' Association has brought out Chemical Safety Data Sheet SD-23 on calcium carbide, the twenty-third in the series of chemical product safety manuals being prepared by them. Designed for supervisory staffs and management, the manuals concisely present essential information for the safe handling and use of chemical products.

Each manual sets forth lucidly the important physical and chemical properties of the product; usual shipping containers and methods for their unloading and emptying; container storing and handling; and recommended personal protective equipment. Health hazards and their control are covered in a section prepared by the Medical Advisory Committee of the association.

The new manual may be obtained for 20 cents from the Manufacturing Chemists' Association, 246 Woodward Building, Washington 5, D. C. Remittance should be sent with each order.

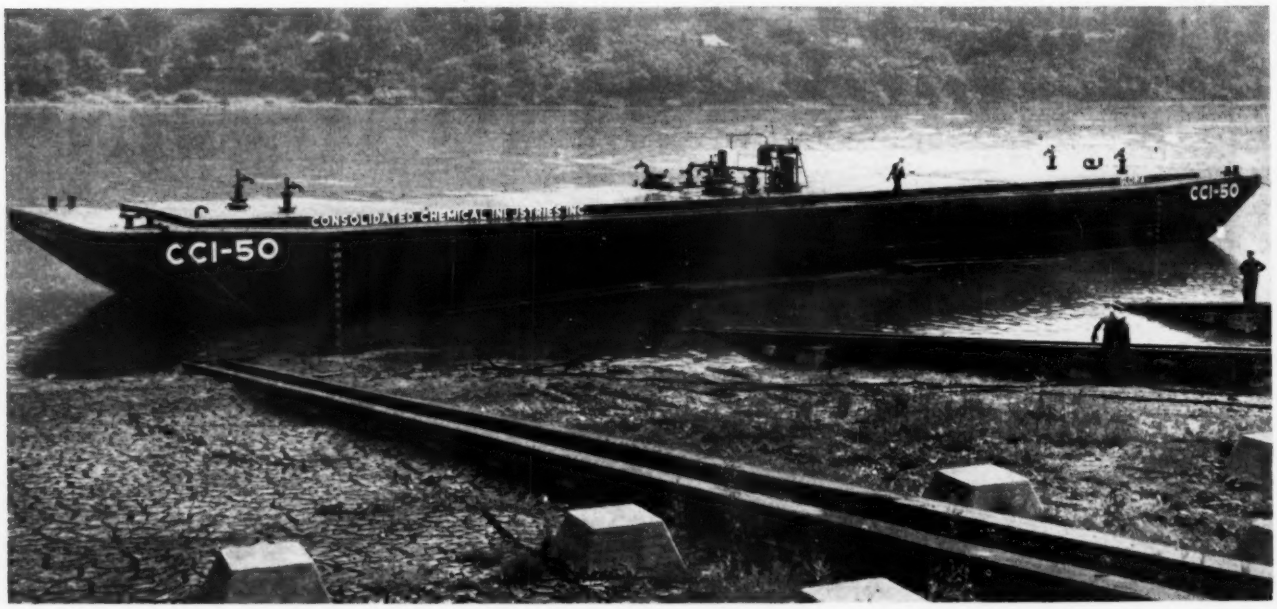
Refrigerator Car Ramp

Newest of the materials handling devices to be developed by the Elizabeth Iron Works is the "Refrigerator Ramp," an all-steel, 15,000 lbs.-capacity ramp for loading and unloading refrigerator cars with a fork truck at railroad sidings.

The "Refrigerator Ramp" operates on the same principle as the company's "One Man Bridge Ramp": it is picked up and transported to position by a fork lift truck. The forks pick up the ramp by means of lift handles which drop flush with the riding surface when the ramp is in use.

The fork truck operator places the ramp to span the gap between car and platform, withdraws forks, drops handles and inserts locking pins which secure the ramp in position. A two-position fixed door stop assures a snug fit of the ramp against wide or narrow refrigerator car door sills. The manufacturer states that the entire operation of positioning and locking the ramp can be accomplished by the fork truck operator alone in less than two minutes.

The ramp is being manufactured in two standard sizes. One will span gaps from 15 to 32 inches, the other, gaps



Sulfuric acid will be shipped on the Intracoastal Waterway in this newly designed steel barge.



But who wants to play Blind Man's Buff?

There are two ways of walking through a manufacturing plant. *One* is to be alert to see the hidden losses that eat into profits, and be ready to correct them. The *other* is to be blind to outmoded operations, simply because they are familiar.

An outmoded packaging method can cause appalling waste in production and profits. Yet the remedy may be easily yours. A St. Regis Packaging System provides St. Regis multiwall paper bags and St. Regis packers to fill them. This efficient team eliminates manual operations, reduces storage space, cuts container costs.

Over 400 commodities are now being packed in St. Regis multiwalls. Are your products among them? A St. Regis sales office near you will welcome discussion.

SALES SUBSIDIARY OF ST. REGIS PAPER COMPANY

ST. REGIS SALES CORPORATION
230 PARK AVENUE • NEW YORK 17, N. Y.

NEW YORK 17: 230 Park Ave. • CHICAGO 1: 230 No. Michigan Ave. • BALTIMORE 2: 1925 O'Sullivan Bldg. SAN FRANCISCO 4: 1 Montgomery St. • ALLENTOWN, PA.: 842 Hamilton St. • OFFICES IN OTHER PRINCIPAL CITIES—IN CANADA: ST. REGIS PAPER CO. (CAN.) LTD., MONTREAL • HAMILTON • VANCOUVER



from 24 to 44 inches. Both have 15,000 lbs. capacity.

Complete information concerning this item may be obtained by writing to the Elizabeth Iron Works, 510 Green Lane, Elizabeth, N. J.

ICC Regulations Amended

The Interstate Commerce Commission Rules and Regulations were amended on July 22, 1948, as follows:

Commodity list, section 4, by the following changes and additions:

Article	Classed as —	Exemptions and packing (See sec.)	Label required if not exempt	Maximum quantity in one outside container by rail express
(Change) Aniline oil, liquid	Pois. B	No exemption, 339	Poison	55 gallons
(Add) Antimony pentafluoride	Cor. L	No exemption, 249A	White	25 pounds
(Add) Carbon dioxide-oxygen mixture	Noninf. G	302, 303	Green	300 pounds
(Add) Compounds, cleaning, liquid (containing hydrofluoric acid)	Cor. L	244, 254B	White	10 pints
(Add) Cupriethylene-diamine solution	Cor. L	244, 249	White	1 gallon
(Add) Ethyl trichlorosilane	Inf. L	No exemption, 109A	Red	10 gallons
(Add) Explosive rivets	Expl. C	No exemption, 75	—	150 pounds
(Add) Helium-oxygen mixture	Noninf. G	302, 303	Green	300 pounds
(Add) Hexaethyl tetraphosphate and noninflammable compressed gas mixture	Pois. A	No exemption, 331A	Poison Gas	Not accepted
(Add) Potassium, metallic liquid alloy	Inf. S	No exemption, 206B	Yellow	1 pound
(Change) Silicon chloride (tetrachloride)	Cor. L	244, 247	White	1 gallon
(Add) Sodium hydride	Inf. S	No exemption, 206A	Yellow	25 pounds
(Add) Sodium, metallic liquid alloy	Inf. S	No exemption, 206B	Yellow	1 pound
(Add) Tetraethyl pyrophosphate and noninflammable compressed gas mixture	Pois. A	No exemption, 331A	Poison Gas	Not accepted
(Add) Thiophosphoryl chloride	Cor. L	No exemption, 270, 271	White	
(Add) Trichlorosilane	Inf. L	No exemption, 109A	Red	10 gallons

Section 103, paragraphs (a) and (b) (Inflammable liquids, etc.) was amended as follows:

103(a) Inflammable liquids, except carbon bisulfide (disulfide), ethyl chloride, ethylene oxide, lithium aluminum hydride (ethereal), nickel carbonyl, ethyl trichlorosilane and trichlorosilane, spirits of nitriglycerin in excess of one percent by weight, and zinc ethyl, in inside glass or earthenware containers having a capacity not over 1 pint or 16 ounces by weight each, or inside metal containers not over 1 quart capacity each, packed in strong outside containers, except as otherwise provided, are exempt from specification packaging, marking, and labeling requiremens for transportation by rail freight or highway. When for transportation by carrier by water they are exempt from specification packaging, marking other than name of contents, and labeling requirements.

(b) Inflammable liquids, except carbon bisulfide (disulfide), ethyl chloride, ethylene oxide, lithium aluminum hydride (ethereal), nickel carbonyl, ethyl trichlorosilane and trichlorosilane, spirits of nitroglycerin in excess of one percent by weight, and zinc ethyl, in inside containers having a capacity not over 1 pint or 16 ounces by weight each, packed in strong outside containers, are exempt from specification packaging, marking, and labeling requirements for transportation by rail freight, rail express, or highway. When for transportation by carrier by water they are exempt from specification packaging, marking other than name of contents, and labeling requirements.

The reason for this amendment was to provide for the transportation of new articles of commerce.

A new section, 109A, was added as follows:

109A (a) Ethyl trichlorosilane and trichlorosilane must be packed in specification containers as follows:

(b) Spec. 15A or 16B.—Wooden boxes with glass inside containers not over 1 quart capacity each securely closed and cushioned with incombustible absorbent material.

(c) Spec. 5A.—Metal drums not over 55 gallons capacity not authorized for the shipment via rail express.

(d) Spec. 5F.—Metal drums not over 11 gallons capacity not authorized for shipment via rail express.

(e) Specification cylinders as prescribed for any compressed gas, except acetylene.

This addition was necessary to provide specification packaging for ethyl trichlorosilane and trichlorosilane.

Section 154, paragraphs (aa), (ff), and (xx) (*No exemptions*), was amended as follows:

(aa) Potassium, metallic and potassium, metallic liquid alloy.

(ff) Sodium, metallic and sodium, metallic liquid alloy.

(Add) (xx) Sodium hydride.

A new section, 206A, was added as follows:

206A (a) Sodium hydride must be packed in specification containers as follows:

(b) In containers as prescribed in section 206 (a)(2) and (a)(3).

(c) Spec. 17H.—Metal drums (single-trip).

(d) Spec. 37D.—Metal drums (single trip) with welded side seams and hermetically sealed closure or closure made fast by positive pressure of the lid against a rubber gasket with edge of the lid crimped over the lip of the drum and a protective metal ring fastened around the crimped edge, packed in strong outside wooden boxes.

The reason for this addition was to provide specification containers for a new material.

A new section, 206B, was added as follows:

206B (a) Sodium and potassium, metallic liquid alloy must be packed in specification containers as follows:

(b) (1) Spec. 15A or 15B.—Wooden boxes with inside metal containers of a type approved by the Bureau of Explosives cushioned with incombustible cushioning material. Each container must have been tested hydrostatically to a pressure of not less than 60 pounds per square inch. Closing devices must be protected from injury.

(b) (2) Not more than 250 pounds of sodium or potassium liquid alloy may be shipped in one outside container.

The reason for this addition was to provide for the transportation of new articles of commerce.

Section 245 was amended by the following:

(Add) (aa) Antimony pentafluoride.

A new section, 249A, was added as follows:

249A (a) Antimony pentafluoride must be commercially anhydrous and must be packed in specification containers as follows:

(b) Spec. 3A1800, 3E1800, 3B240, 4B240, or 4BA240.—Cylinders closed by means of iron or steel threaded plugs.

The reason for this addition was to regulate shipment of a new commodity.

Section 252 (Bromine) was amended by addition of the following:

(j) (1) Bromine which has been dried in accordance with good commercial practice may also be packed in specification containers as follows:

(j) (2) Spec. 5K or 5M.—Nickel or monel drums of not over 10 gallons capacity each and containing not more than 225 pounds net weight of bromine. Drums must be of metal at least 14 gauge United States standard throughout and must have chime reinforcement adequate for their protection. All openings must be in one head and closing parts (plug, cap, flange, etc.), must be of the same metal as the drum. One opening not over 2.3 inch diameter and one opening not over ¾" standard pipe size are permitted. Each drum must be completely emptied and dried before reuse and must be equipped with gaskets of a material approved by the Bureau of Explosives.

The reason for this amendment was to provide additional containers for shipments of bromine, the efficiency of which has been proved by exhaustive tests.

A new section, 254B, was added:

(*Turn to page* 529)

Uncanny Facts

A whole sheep...in a can! In Paris, in 1852, an entire sheep was packed in a huge can just to prove that it could be done!



Thar's nutrition in them thar juices! Housewives are urged to use the fluids which are found in canned foods. In this way it's possible to benefit from all the value of food packed in cans.

The power of suggestion! Continental's suggestion system pays employees for new ideas to improve operations, machinery, products or services. Many improvements have come from this source.



Fibre can take it! They're light in weight but extremely strong, these Continental fibre shipping drums. They're made to ship up to 400 pounds of dry, bulk products.

You've never seen a whole sheep in a can. But we'll bet you have seen lamb stew -- and enjoyed it, too! And ham, and roast beef, and corned beef hash -- all packed in cans.

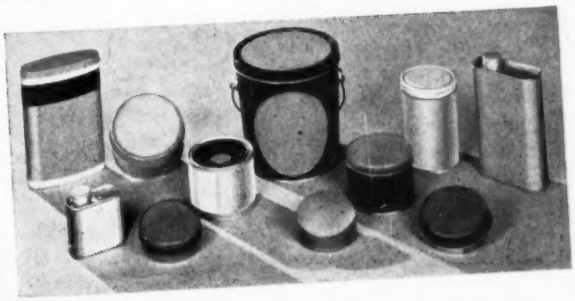
Back in 1852, meat canning was just out of the experimental stage. (That year Sir Edward Belcher took "preserved meat" with him on an arctic expedition.) Today, 25 or more varieties of meat, from beef stew to Vienna sausage, are packed in cans.

Continental has done its part to help the meat-packing industry grow. Through research and cooperation we hope to do even more. That goes, too, in making paper cups and containers, fibre drums, plastics, and crowns. Which is why our customers agree: "The bigger the family... the better the service."

The bigger the family...

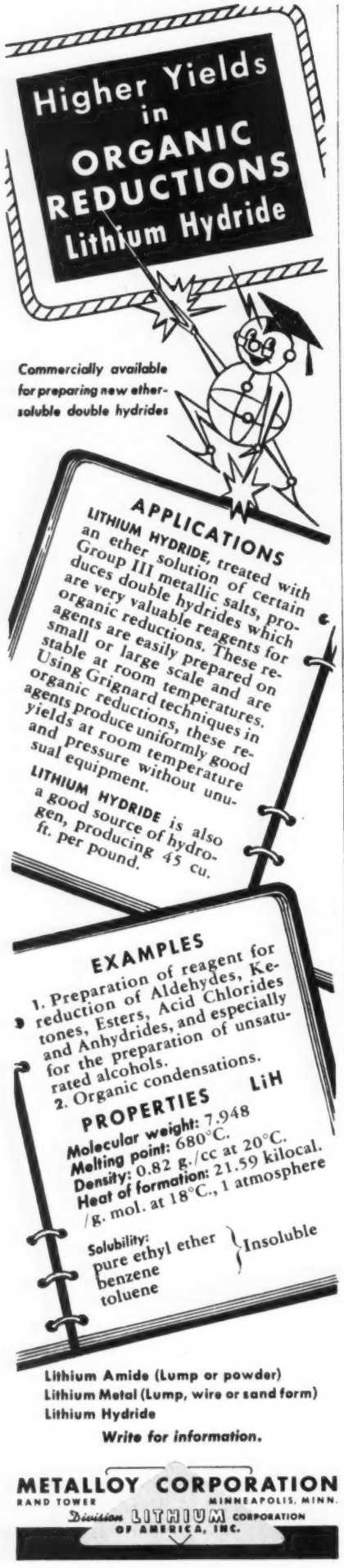
CONTINENTAL CAN COMPANY

...the better the service!



We're spot-lighting this national ad in hopes you'll get to know us better. In your field, Continental's in the spot-light with the finest containers money can buy.

Now available are: "Tripletite" friction-plug containers, pails, square or oblong "F-style" cans—plain or lithographed with your own design.



PLANT OPERATIONS NOTEBOOK

Renew Rubber Gloves

The experience of the Stewart-Warner Co. in the application of latex to increase plant safety has been noted by Mack R. Krantz in the NSC News Letter.

They have dipped all parts in contact with easily blistered hands in latex until enough rubber has built up on the surface to act as a cushion.

In another application trouble was experienced with rubber gloves wearing out at an extremely rapidly rate. Dipping the used gloves in latex built up a new coat of rubber enabling the gloves to be reused. If the continued recoating results in a ragged appearance, the entire coating is peeled off and a new start made.

Index to Standards

The new 240-page "Index to A.S.T.M. Standards" is a convenient source for locating test methods or determining whether such are issued. The publication is furnished without charge upon written request to A.S.T.M. Headquarters, 1916 Race St., Philadelphia 3, Pa.

Safety Publications

Safety instruction cards obtainable from the National Safety Council include No. 614—Carbon Tetrachloride, No. 615—Methanol, No. 616—Acetone, No. 617—Rescue from a Manhole. Also available is safety Reprint No. 5 "Health Aspects of Welding." Prices on request by writing to 20 N. Wacker Drive, Chicago, Ill.

Air Flow Calculation

Engineers, maintenance men and others who are called upon to calculate final pipe diameters, air volumes, static loss and other air flow figures can save time and get the right answers quickly with a Norblo air flow calculator. The calculator is a nomograph, arranged as a 6" circle and using both sides for calculations.

For example, only a very small portion of the calculator is required to figure out the size of Norblo dust collectors (centrifugal, automatic or standard bag types) for a specific cfm with either 2 to 1 or 3 to 1 free cloth area.

The use of both sides and the 6" diameter of the calculator permits the use of large clear, easily read scales. The calculator will be sent free to anyone who has use for it, if request is made directly to The Northern Blower Co., 6409 Barberton Ave., Cleveland 2, Ohio, on the business letterhead of the writer's company.

Fire Extinguisher

American - LaFrance - Foamite Corp., Elmira, N. Y., is producing a complete new line of 2½ gallon resistance welded silicon bronze fire extinguishers to replace riveted and copper fabricated units of the same capacity. They are Soda-Acid; Foam; plain Water and Anti-freeze Water types. Each is lighter in weight by 4½ pounds.

NOMOGRAPH-OF-THE-MONTH

Edited by DALE S. DAVIS

Readers are invited to submit for publication in this department any original nomographs pertaining to chemistry or engineering. $10 will be paid for each one used.

Nomograph for Determination of the Softness Factor of Rubber

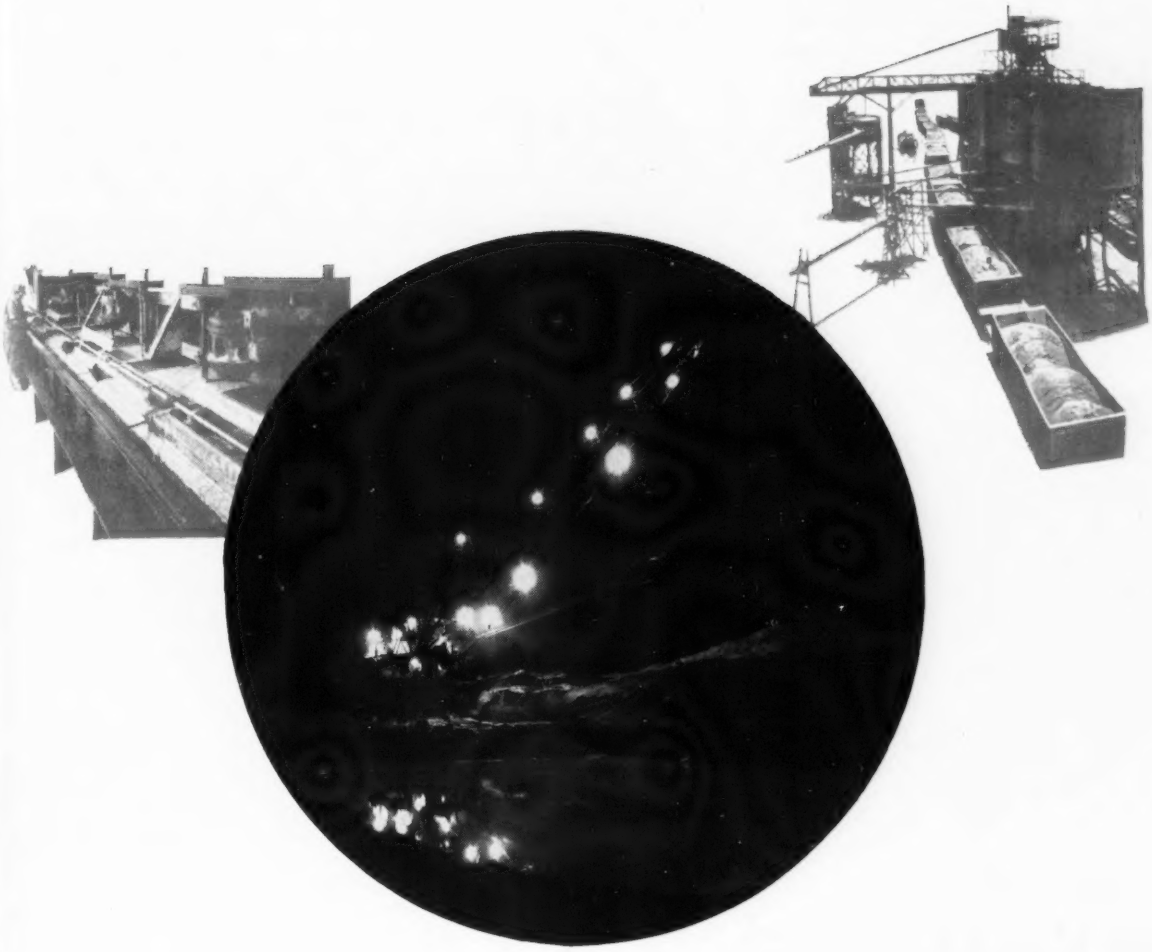
by H. M. LEEPER and D. S. DAVIS
Government Laboratories,
University of Akron

IN connection with the determination of the softness factor, S, of rubber by means of the simplified Goodrich plastometer, Karrer, Davies and Dietrich (2) gave the equation

$$S = \frac{h_0 - h_1}{h_0 + h_1}$$

where h_0 and h_1 are the respective heights of the test piece in thousandths of an inch, initially and after compression for 30 seconds.

The accompanying nomograph, which enables rapid and accurate solution of the equation, was constructed by me-



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thods described previously (1) for the rearrangement:

$$\frac{h_0}{h_1} = \frac{1 + S}{1 - S}$$

The use of the chart is illustrated as follows: What is the softness factor when the initial height is 0.462 inch and the height after compression is 0.158 inch? A straight line connecting 462 on the h_0 scale with 158 on the h_1 scale will intersect the softness scale at **S = 0.49.**

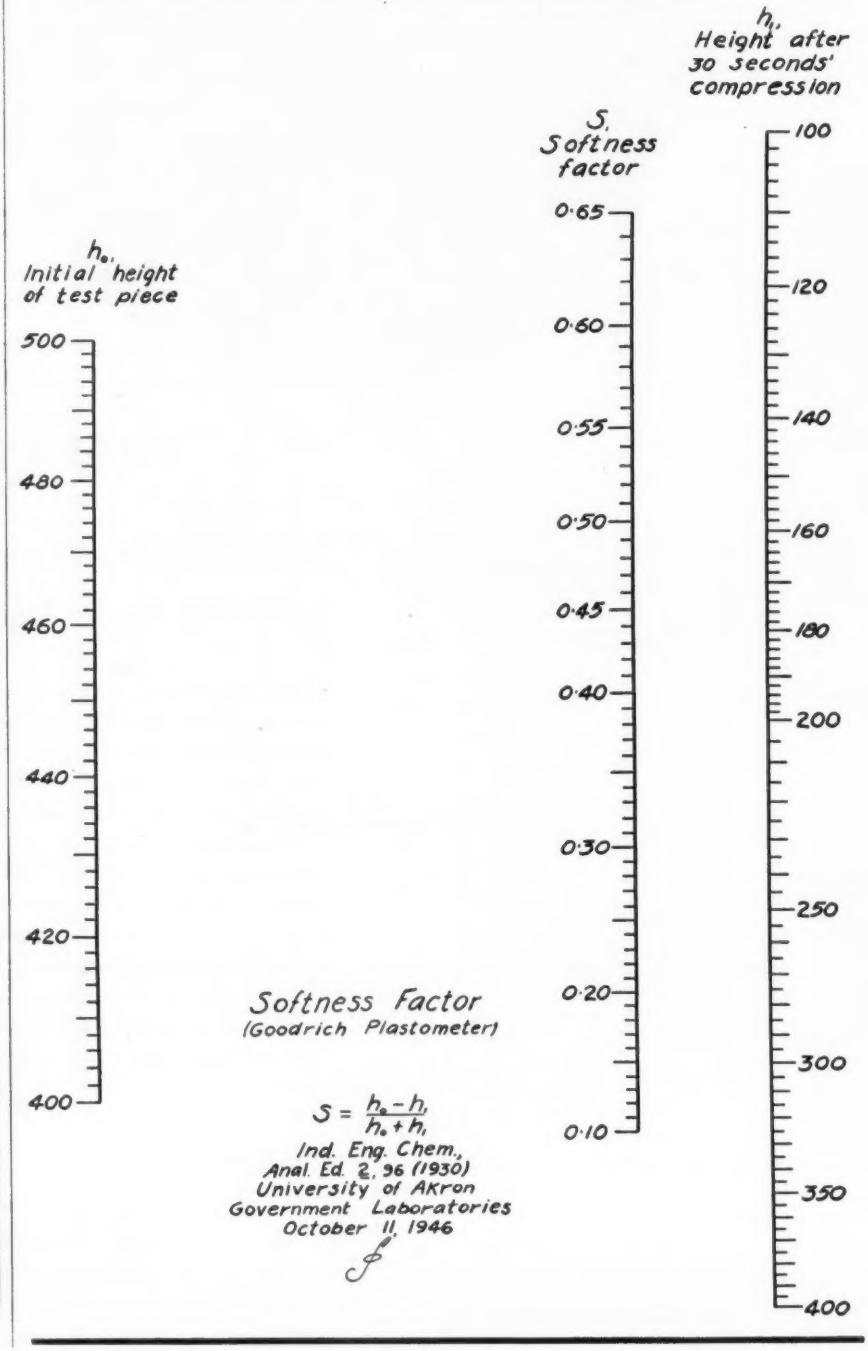
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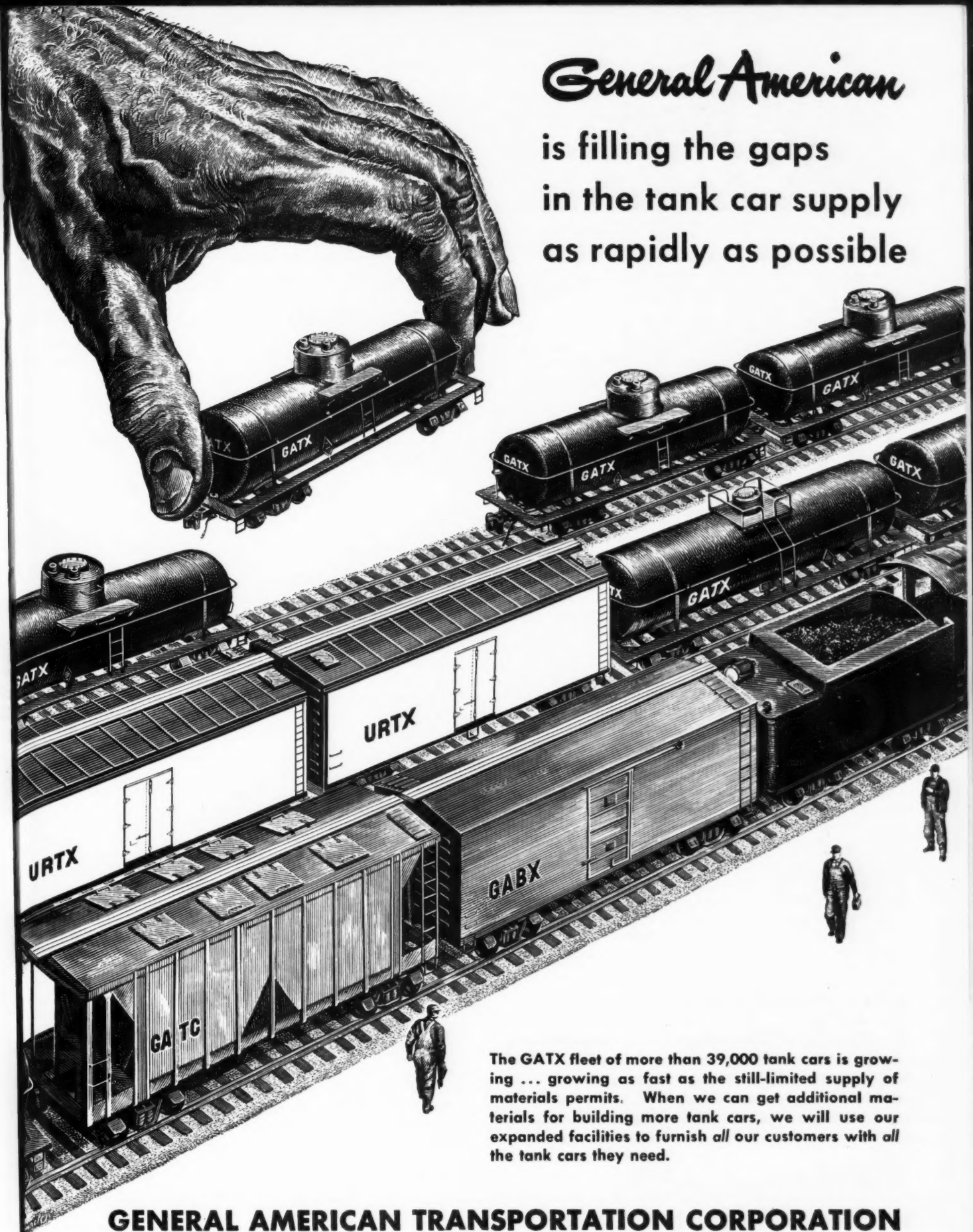
(1) Davis, D. S., "Empirical Equations and Nomography," Chap. V, New York, McGraw-Hill Book Company, 1943.

(2) Karrer, E., Davies, J. M., and Dieterich, E. O., Ind. Eng. Chem., Anal. Ed., 2, 96 (1930).

IV—Bibliography of Chemical Engineering Nomographs

Supplementing "Bibliographies of Chemical Engineering Nomographs—I, II and III" (Documents 1599, 1809 and 2222, respectively, American Documentation Institute), a 10-page bibliography has been prepared by D. S. Davis of the Government Laboratories managed by the University of Akron, Office of Rubber Reserve, Akron, Ohio, and deposited with the American Documentation Institute, 1719 N Street, N. W., Washington 6, D. C., as Document 2528. It may be obtained from the Institute at 50 cents a copy on microfilm or at $1.00 for photo copies (6 x 8 inches) readable without optical aid.





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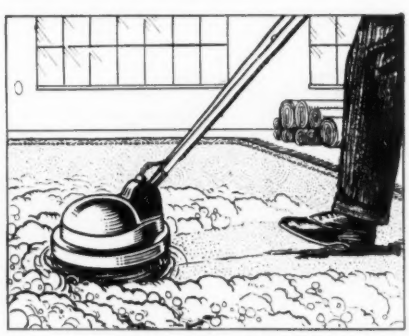
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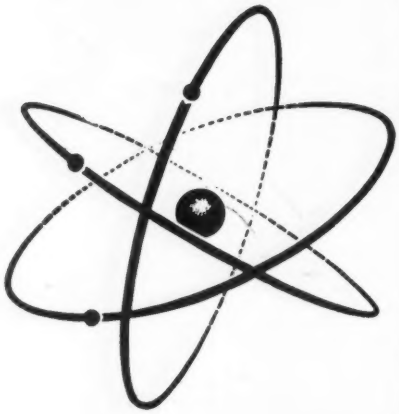
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LABORATORY NOTEBOOK

O_2 Determination

An improved technique for the direct determination of oxygen in high-molecular weight organic compounds has been developed by W. W. Walton, F. W. Mc Culloch and W. H. Smith of the National Bureau of Standards, Washington 25, D. C., by which small amounts of oxygen, such as occur in natural and synthetic rubbers, in plastics prepared from hydrocarbons, and in mineral oils, can be measured with precision and accuracy. Essential features of the procedure are thermal decomposition of the sample in an atmosphere of oxygen-free helium and conversion of the resulting oxygen compounds to carbon monoxide by passage of the products over carbon at 1120° C. The oxygen content of the material is then calculated from the percentage by volume of carbon monoxide in the collected gas.

X-Ray Diffraction

New fields of application for x-ray diffraction in the identification and quantitative analysis of unknown materials have been opened by the new high-precision, high-output machine of the General Electric X-Ray Corp., 4855 W. McGeoch Ave., Milwaukee, Wis.

One attachment, the fluorescent analyzer, extends the range of materials which can be analyzed, in comparison with use of optical spectrometers. Another group makes possible the direct recording of x-ray intensities on a continuous strip of chart paper, revealing both the angular placement of the characteristic lines of materials and their relative intensities.

X-ray intensity of the unit is controllable and reproducible to an overall accuracy of 0.5%. The accuracy is accomplished by controlling the x-ray tube voltage to within 0.1% and the tube current to within 0.02%.

The high output is achieved through the use of a new sealed-off diffraction tube with three pure beryllium windows, which are within one inch of the end and the focal spot of the tube. The tube is excited from a high-voltage transformer and full-wave rectifier rated at 50 kv.p., 50 ma., anticipating future improvements.

As a result of the precision mechanical construction, the spectrogoniometer reads angles directly down to 0.01°.

The new instrument may be used for three purposes:

One is for the direct measurement of x-ray diffraction intensities through the use of a Geiger-Mueller counter with a rate mter, scaler and chart recorder.

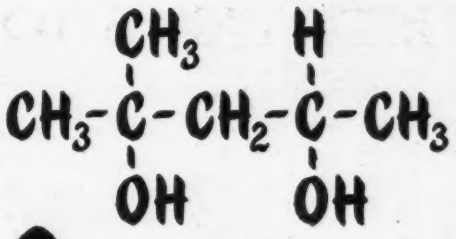
The second manner is as a fluorescent x-ray spectrometer, employing a focusing crystal analyzer.

Third, it may be employed, with x-ray sensitive film, as a conventional x-ray diffraction unit.

Thermostat

A modification of the widely used Scaico thermostat has been made with special emphasis on its use as a laboratory instrument. The unit consists of a 9" 18-8 stainless steel sensitive element and operates on the principle of differential expansion between outer shell and inside element, but due to the fact that it is the outer shell which is directly responsive, high sensitivities are said to be obtained, (± .03° C.). It has a capacity of 500 watts, 115 volts A.C., temperature range of room to 200° C., and is available from the Smith Control & Instrument Corp., 1329 Highland Ave., Needham 92, Mass.





Hexylene Glycol

A new plant at Houston, Texas has greatly increased the supply of this valuable solvent

PROPERTIES	
Molecular Weight	118.17
Specific Gravity 20°/4°C	0.9216
Boiling point (760 mm.)	198.27°C
Flash Pt., Cleveland Open Cup	230°F
Vapor Pressure at 20°C	0.02 mm. Hg
Refractive Index, n_D^{20}	1.4276
Viscosity at 20°C	41.7 centistokes
Weight (pounds per gal. at 20°C)	7.69

Among the many other Shell Chemical products are Tertiary Butyl Alcohol, Diacetone Alcohol, Allyl Alcohol, Diisobutylene and Acrolein

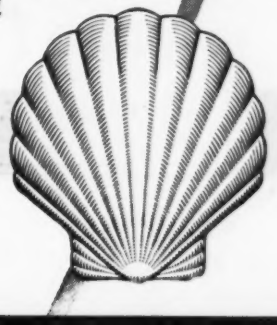
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AS A COUPLING AGENT it offers distinct advantages in the formulation of *hydraulic brake fluids* because of its water tolerance, lack of rubber swell and compatibility with castor oil in all proportions. In addition, its chemical stability, viscosity index, lubricating properties and non-corrosiveness are equally satisfactory. HG is also widely used as a coupling agent and emulsion stabilizer in *engine cleaning compounds* and *"soluble" cutting oils.*

AS A SOLVENT its steep vapor pressure curve, good resin solvency and comparatively mild hygroscopicity make it particularly useful in the manufacture of "flash dry" and other types of *printing inks.*

AS A PENETRANT its mildly hygroscopic character, plus notable softening and coupling properties, suggest its use as a component of *yarn lubricants, mercerizing assistants and other textile chemicals.*



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INDUSTRY'S BOOKSHELF

Nomography

ELEMENTS OF NOMOGRAPHY, *by Raymond D. Douglass and Douglas P. Adams.* McGraw-Hill Book Co., New York; 209 pp., $3.50. Reviewed by D. S. Davis.

DOUGLASS and Adams have drawn on their wealth of teaching experience at M. I. T. to give us an eminently practical and mathematically impeccable text on the essentials of nomography. In sixteen short and two long chapters, supplemented by 111 excellent figures, they have led the reader by easy stages from elementary concepts into those adequate for the construction of industrially important charts.

Most of the illustrations and exercises are admittedly academic but they were thoughtfully designed to bring out important points of theory and construction. Therein lies much of the strength of the text, the definite engineering flavor of which is subtly concealed rather than blatantly evident. Consistent nomenclature and symbols are employed, excessive "typing" of equations is carefully avoided and slipshod cut-and-try methods, too often the refuge of pseudonomographers, are properly castigated. It is a triumph for "our" side that these veteran teachers have wisely ignored the determinant approach, so dear to the heart of the formal mathematician, and have settled on the geometric method, which is so much better adapted to practical needs.

Stripped of potentially unwieldy functional notation, the proofs may be slightly lacking in delicate beauty but they are logical and basically familiar and constitute staunch, friendly beacon lights to the student who, alone, navigates the sea of nomography. The authors know exactly where such marinomographers are apt to get off the course and at such points they provide welcome time-tested aids. Partial N diagrams, always troublesome, are handled firmly but with care; the excellent treatment of hexagonal charts may compensate for the somewhat scant attention given to the industrially important recurrent variable equation $x = x'y + z$; the account of the orphan and little-known circular diagram is unusually complete.

Most students have little difficulty in grasping the underlying theory; their charts fail more often from lack of practicality, from poor organization of data and from computational errors. The authors make extensive use of printed forms for marshalling the data and calculations so necessary to the success of the nomograph while warning the reader of the pitfalls attendant on blind, unintelligent adherence to this system.

In common with most nomographers, the authors prefer the scales on their parallel axes charts to be of equal length, though somewhat inconvenient modulus or scale values result. Unable to find anything questionable in the mathematics of the presentation, your admiring reviewer can only pounce upon and pretend to be alarmed at the use of the unfortunate "diagram's scales" on page 134 and the omission of the professional "0" before the decimals on pages 16 and 29. The charts are clear, bold and only occasionally crowded; indexing is good; the editing is excellent and the quality of paper is the best that present conditions permit. Far superior to British texts in the field and certainly the most informative book on nomography in 30 years, this work will make new friends for the authors who have already put their nomographic imprint on the minds of a great many of our best engineers.

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CRYSTALLIZED GINGER: It "granddaddied" an industry and points the way to better packaging for you!

Thirty and more years ago, there were only three quality confections which came in tin containers . . . crystallized ginger . . . crystallized pineapple . . . and after-dinner mints.

Chocolates were not packaged in tin at that time.

But a man in New York City, who made quality chocolates, wanted to keep his product fresh longer and thereby broaden his market.

He knew that the conventional chocolate package—cardboard—wouldn't do the job.

So, he came to American Can Company for advice. It seemed to us that the ginger container, re-styled and re-designed, would protect the freshness of his product.

We were right. Today, this candy manufacturer is still selling his top-notch chocolates in the gold and mauve tin container we originally suggested to him.

The tin box for candy and other confections, in a multitude of shapes and closures, has made quality products available to more people, has helped build a huge industry, and has produced agreeable profits all along the line.

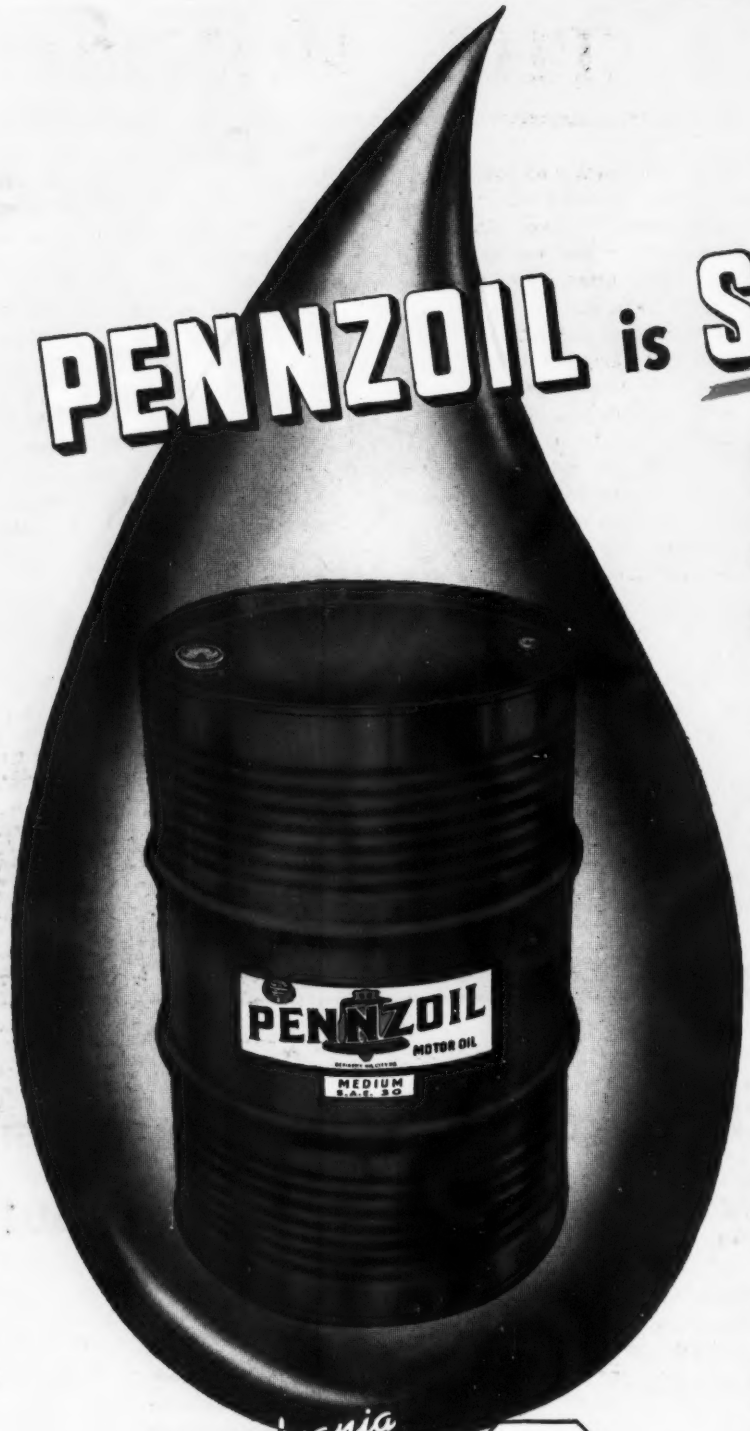
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in drums equipped with Tri-Sure Closures



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NEWS OF THE MONTH

Heyden Enters Streptomycin Field

Entry of Heyden Chemical Corp. into the streptomycin field (CI *Newsletter*, June, 1948) on a large scale has been officially disclosed with the announcement that production of the drug, using a new process, is under way at the company's plant near Princeton, N. J.

Company officials state that the new process is a marked improvement over conventional methods and results in a product of great purity. It is the culmination of months of research carried on at that location and in the laboratories of several other Heyden plants.

The still-scarce antibiotic, which has proven its effectiveness in the treatment of certain types of tuberculosis and in other diseases resistant to penicillin, is being produced in a new unit of the plant especially designed for the purpose, with the equipment mainly of stainless steel.

Pittsburgh Plate Promotes Peters



Rolland I. Peters, appointed technical director of the Ditzler Color Division, Pittsburgh Plate Glass Co. He succeeds M. G. Bell, who will enter business for himself.

WAA Sells Ammonia Plant to Mathieson

The War Assets Administration and Mathieson Chemical Corp. have concluded an agreement for the chemical company to purchase the ammonia plant and ammonia oxidation facilities at Lake Charles, La., for a reported purchase price of $7,063,300.

Built by Mathieson for the Defense Plant Corp., the plant was leased to the company and production began in the fall of 1944, the entire output going into the manufacture of high explosives for the remainder of the war period. After the war, at the request of the government, Mathieson continued to operate part of the plant for the production of nitrogen gas, used in purging the Big-Inch pipeline preparatory to placing the latter in standby condition. Early in 1947, Mathieson negotiated with the government a long term lease for the entire plant facilities and after an extensive rehabilitation program, the ammonia plant was put into full operation.

The Lake Charles ammonia plant is located in the rich Delta agricultural area where the heavy demand for nitrogen fertilizers is increasing and where direct application of ammonia to the soil has proved highly successful. It is anticipated by the company that a large part of the ammonia production at Lake Charles will be used for agricultural purposes.

New ACS Section Near Hanford Works

A new local section of the American Chemical Society has been established at Richland, Wash., where plutonium, principal source of atomic energy, is manufactured. The new group, with a charter enrollment of 102 members, will be known as the Richland Section, and will consist of chemists and chemical engineers of Benton and Franklin counties in the State of Washington.

Robert Lee Moore of the technical department of the General Electric Co.'s Hanford Works, Richland, is the first chairman of the section, which has headquarters in that town. In 1943, Richland was a hamlet of 242 persons, but in the five years since the establishment of the Hanford Works there, its population has increased to more than 15,000. The other charter officers of the new section are also associated with the Hanford Works.

Calco's Willow Island Plant Completed

Completion of the third production unit concludes the construction work now planned at the new huge chemical plant of the Calco Chemical Division of the American Cyanamid Co. located on an eleven hundred-acre site at Willow Island, West Virginia. The first unit of the Willow Island Plant went into operation November 25, 1947 for the production of pharmaceuticals including the new drug, folic acid. A second unit was completed in February, 1948 for the manufacture of iron blue, a pigment very widely used in printing inks and surface coatings.

The new manufacturing unit produces melamine which had remained a laboratory curiosity since its discovery in 1834 until Cyanamid's fundamental research on nitrogen compounds and its extensive engineering facilities enabled it to produce the first carload in 1939. Since that time melamine derivatives have served many industries, including the paint and varnish, plastics, paper, and textile industries.

International Salt Names Green



Edson K. Green, appointed general sales manager of International Salt Co. He has been assistant sales manager since 1945.

Technical Bureau New Feature at Exposition

The newly created "Technical Bureau" at the National Chemical Exposition, Chicago Coliseum October 12-16, 1948, will be a personal information service available to all who are in attendance. It will be manned between 3 and 6 p.m. each day by Ward V. Evans, retired chairman of the chemistry department of Northwestern University, now professor of chemistry, Loyola University.

Dr. Evans is eminently qualified to give helpful, over-the-counter information to business men and manufacturers seeking knowledge of how the chemical industry can help them with their problems. He will also supply directions to the proper place on the Exposition floor for other desired information.

Thousands of specific problems, both

on product development and production, are brought to the Exposition. It is intended that the technical bureau personal service should speed up the finding of the solutions to these problems.

Carrying on this aim of service will be the program of the National Industrial Chemical Conference which is running concurrently with the National Chemical Exposition under the same roof. Eighteen speakers will discuss subjects that will have interest for the executive and technical personnel of all industry—chemical and non-chemical (chemical consuming), and will be of particular help to the latter. There will be three speakers on three subjects under the general heading of "Chemical Markets"; five, on five subjects under the general heading of "Chemistry in General Industry"; and three, on three subjects under the general heading, "Hazards from Chemicals."

Glidden Increases Expansion Plans

The Glidden Co. will build a $3 million soy bean extraction plant in Indianapolis. This brings to more than $15 million the amount allocated for new plants, modernization work or plant additions since June, 1945, and increases to 35 the number of factories operated throughout this country and Canada.

Cleveland, Glidden headquarters city, has shared in the expansion program with the construction of a new alkyd resin unit and modernization of the varnish plant here. Other cities where Glidden plants have been enlarged, modernized or newly built include Reading, Penna.; San Francisco; Toronto; Norwalk, Ohio; Elmhurst, L. I.; Baltimore; Jacksonville; Chicago. Recently Glidden announced plans for erection of several new manufacturing units at Macon, Ga., at a cost of more than $2 million.

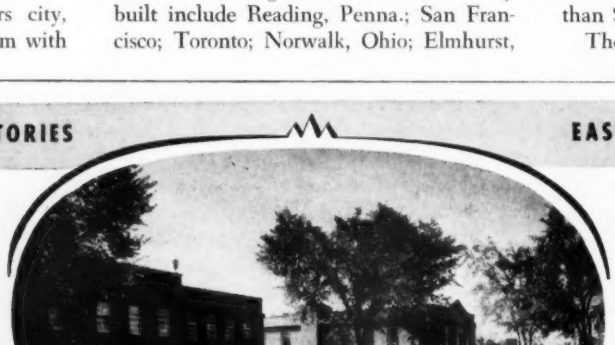
The new Indianapolis plant will con-

Mallinckrodt Awarded Achievement Certificate



William Barry, vice-president of the Mallinckrodt Chemical Works, receiving, on behalf of the company, a Certificate of Achievement of the U. S. Navy Bureau of Medicine and Surgery. Rear Admiral A. H. Dearing is presenting the certificate for services rendered to the Medical Dept. of the Navy during the war.

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Jos. A. Burns

PORTLAND, ORE.
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ST. LOUIS
Harry G. Knapp

SAN FRANCISCO
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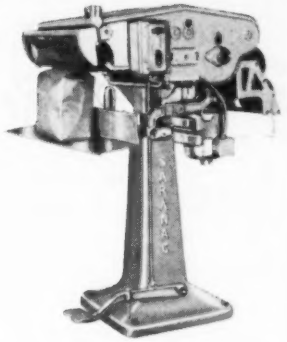
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Acetic Acid—Acetate of Lime
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Methyl Acetate
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Turpentine—Rosin
Benzol—Toluol—Xylol
Sodium Benzoate U. S. P.
Benzaldehyde { Technical- N. F. F. F. C.
Whiting
Magnesium Carbonate
Magnesium Oxide

Anti-Freeze—Methanol and Alcohol

sist of several buildings connected by bridges for transfer of material in various stages of processing. It will also include a 1,500,000-bushel grain elevator. It will be built adjacent to the company's large feed mill in the Indiana city.

Chemical Company Half Year Earnings

Company	Net Income After Taxes 1948	1947
Air Reduction Co...	$3,044,797	$2,926,640
Atlas Powder Co...	589,859	1,017,261
Devoe & Raynolds Co., Inc.	1,267,788	1,644,991
Dow Chemical Co..	21,066,646*	12,729,990*
Freeport Sulphur Co.	1,848,802	1,407,988
Hercules Powder Co.	5,719,518	7,312,900
Heyden Chemical Corp.	2,039,701	1,387,502
Industrial Rayon Corp.	5,825,929	
Lion Oil Co.	5,719,994	3,039,143
Mathieson Chemical Corp.	1,871,485	1,510,730
Monsanto Chemical Co.	7,926,759	9,275,133
National Lead Co..	6,512,990	6,479,049
Penick & Ford, Ltd., Inc.	697,317	1,321,390
Sterling Drug Inc..	7,534,573	7,083,328
Union Carbide and Carbon Corp. ...	47,061,574	36,071,419

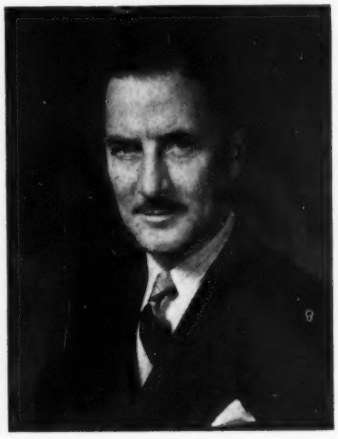
*Annual earnings

COMPANIES

The REHEIS CO. (formerly SCHOFIELD-DONALD CO., INC.) manufacturers of fine chemicals, is now located at Berkeley Heights, N. J. The new quarters which are on the D.L. & W.R.R. will accommodate all facilities including laboratories, offices and factory.

MILLMASTER CHEMICAL CO. has been appointed exclusive Eastern sales representative for ARAPAHOE CHEMICALS, INC.

Victor Appoints Stanley



Morris R. Stanley, named assistant director of sales, Victor Chemical Works. He joined the company in 1923.

DEVOE & RAYNOLDS CO., INC., paint manufacturers with headquarters in New York, has acquired the BISHOP-CONKLIN paint company of Los Angeles, California.

In addition to enlarging the present production facilities of the Bishop-Conklin Company, a new synthetic resin plant will be constructed and should be in operation in late October.

HOUDRY PROCESS CORP. has announced that TIDE WATER ASSOCIATED OIL CO. will install a thermofor catalytic cracking (T.C.C.) unit at its Drumright, Oklahoma, refinery.

The T.C.C. unit is designed to charge 4,500 B/D with additional capacity up to 6,750 B/D for recycling. One of the cat cracker's important design features is its ability to handle either Oklahoma gas oils or high sulphur West Texas gas oils as charge stocks.

Work is near completion on an extension of the silicate of soda producing facilities of DIAMOND ALKALI CO.'s Dallas plant located at South Lamar and Lenway Streets.

The addition, estimated to cost near $250,000, is a part of a $30,000,000 plant expansion program underway in Diamond Alkali's various units.

Diamond has recently completed a $15,000,000 chlorine-caustic soda plant at Houston. It is expected to reach full production by fall.

The Dallas plant, built in 1941 for the production of silicate of soda, is the only one of its kind in the Southwest.

McCook, Illinois, has been chosen at the site of the new, modern plant of TURCO PRODUCTS, INC., manufacturers of spe-

KOPPERS

TAR BASES

refined grades include:

Pyridine
Alpha Picoline
Mixed Picolines
2,4 Lutidine
Mixed Toluidines
Quinoline
Isoquinoline
Quinaldines

Koppers Tar Bases are soluble in many organic solvents, including alcohols, ethers, esters, hydrocarbons, and ketones. The lower-boiling bases are completely miscible with water in all proportions. The water-solubility of the bases decreases with increases in molecular weight.

Typical uses—Manufacture of pharmaceuticals and vitamins · Water-repellent finishes for cotton, rayon, silk, and wool · Solvents for dyes · Fungicides · Inhibitors in the pickling of iron and steel · Alcohol Denaturant Solvents for bitumens, oils, resins, waxes, and metallic salts · Manufacture of rubber accelerators · Catalysts in the manufacture of synthetic resins.

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• Economical • Simple • Convertible • Automatic

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Fully automatic, this packer-weigher fills approximately 90% of the total net weight at the first station. Partially filled container is then automatically lowered and transferred onto the gross weigher platform, where filling operation is completed. Filled container is then delivered to the discharge turret plate. One operator ONLY is required—to register container on packing station tube.

PACKER-WEIGHER handles containers from 6" to 22" high; weights from 1 lb. to 25 lb. depending on product and container size. Interchangeable augers and tubes make it possible quickly, easily, to switch from one container size or weight to another. Unit is available for immediate delivery.

For additional information on this and other PACKOMATIC packaging machinery—including paper shipping case sealers, top & bottom carton fillers and sealers, and a wide range of standard and special packaging equipment, consult Metropolitan Classified Telephone Directory for location of nearest PACKOMATIC office—or write Joliet.

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- **HYDRAZINE BASE 93-95%**
- **HYDRAZINE HYDRATE 85% 100%**
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  Use: Manufacture of intermediates for dyes and pharmaceuticals. Hydrazine Base has solvent properties similar to liquid ammonia.
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  Use: Isolation of ketones and aldehydes, forming well-defined crystalline compounds.
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- **PARA DIAZODIMETHYLANILINE**
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  Use: The stabilized salts are used in light-sensitive diazo-type coatings.

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SUGGESTED USES: As an emulsifier in the manufacture of cosmetics, pharmaceuticals and food stuffs (including paste emulsions of edible oils, shortenings, etc.) . . . as a protective coating for Edible Hygroscopic Powders and similar crystals and tablets (and even fresh fruit and vegetables) . . . as a pour point depressant for lubricating oils . . . as a lubricant for paper and cardboard in dry die-forming . . . as an emulsifying agent in the polymerization of synthetic rubber . . . as a protective anti-oxidant coating for metals . . . as a preliminary binder for clays, abrasives, etc. . . . as a general emulsifying or thickening agent . . . as a suspending agent for organic or inorganic materials in aqueous solutions.

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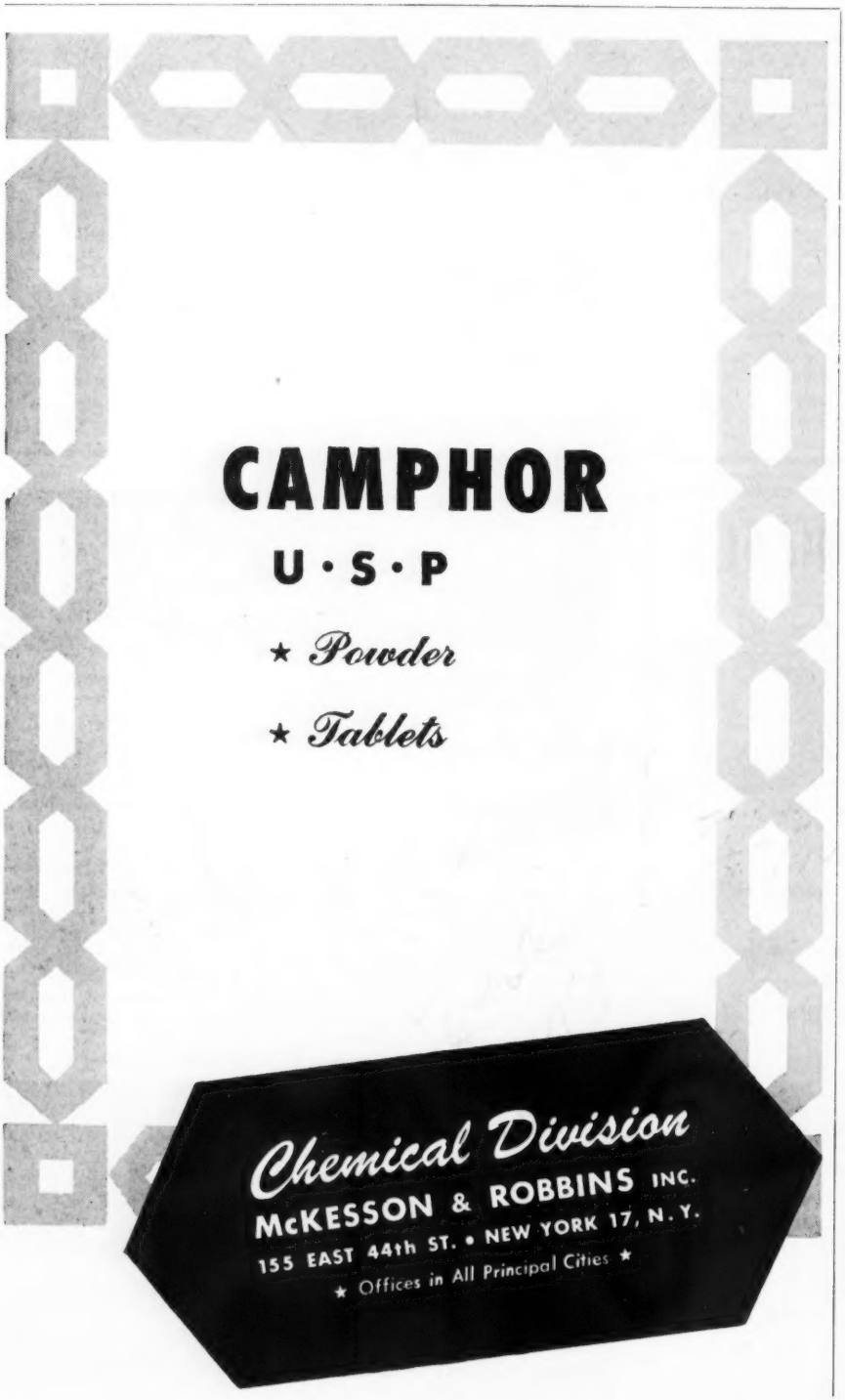
McCook is adjacent to various sources of raw materials and is a central location for distribution of finished compounds.

PERMALITE PLASTICS CO. has been appointed to handle sales, distribution and promotion of a complete line of peroxides manufactured by UNION BAY STATE CHEMICAL CO., INC., of Cambridge, Mass. Establishment of Permalite as a UBS agency enables the Cambridge firm to supply west coast customers with a more complete and efficient service.

F. W. BERK & CO., INC., New York 17, New York, long a key figure in the production of mercury and mercurials, has entered the zirconium field as basic integrated producers of zirconium products.

Using raw materials from company sources in Australia, Berk is producing zirconium products at its plant in Wood Ridge, New Jersey, where complete facilities for the production of all types of zirconium compounds are being set up. Peter Telfair is in charge of sales and development work for the new Berk undertaking.

A. C. Mueller has announced his resignation as sales manager of the Eastern Division of Nuodex Products Co., Inc. to establish his own business, the A. C. MUELLER CO., manufacturer's representatives for the greater Cleveland area.



CALENDAR *of* EVENTS

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS, annual convention, Bon Air Hotel, Augusta, Ga., Oct. 21-23.

AMERICAN CHEMICAL SOCIETY, National Chemical Exposition, Coliseum, Chicago, Oct. 12-16.

AMERICAN GAS ASSOCIATION, annual convention, Atlantic City, N. J., week of Oct. 4.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, regional meeting, French Lick, Indiana, Sept. 15-17.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, regional meeting, Hotel Cortez, El Paso, Texas, Oct. 24-27.

AMERICAN OIL CHEMISTS' SOCIETY, annual Fall meeting, Hotel Pennsylvania, N. Y. C., Nov. 15-17.

AMERICAN PETROLEUM INSTITUTE, Lubrication Committee, Hotel Traymore, Atlantic City, Sept. 16-18.

AMERICAN SOCIETY FOR QUALITY CONTROL, third Midwest quality control conference, Sherman Hotel, Chicago, Nov. 4-5.

AMERICAN STANDARDS ASSOCIATION, 30th annual meeting, Waldorf-Astoria, N. Y. C., Oct. 20-22.

ASSOCIATION OF CONSULTING CHEMISTS AND CHEMICAL ENGINEERS, INC., annual meeting, Hotel Sheraton, N. Y. C., Oct. 11-13.

ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS, INC., annual meeting, Shoreham Hotel, Washington, D. C., Oct. 11-13.

THE ELECTROCHEMICAL SOCIETY, semi-annual convention, Hotel Pennsylvania, N. Y. C., Oct. 13-16.

FOURTH INDUSTRIAL WASTE CONFERENCE, Purdue University, Sept. 21-22.

INDUSTRIAL PACKAGING ENGINEERS ASSOCIATION OF AMERICAN AND THE UNIVERSITY OF ILLINOIS EXTENSION DIV., first annual packaging and materials handling short course, Sherman Hotel, Chicago, Oct. 4-7.

INSTRUMENT SOCIETY OF AMERICA, third instrument conference and exhibit, Philadelphia Convention Hall, Sept. 13-17.

NATIONAL SAFETY COUNCIL, 36th national safety congress and exposition, Chicago, Oct. 18-22.

NEW ENGLAND MATERIALS HANDLING EXPOSITION, Mechanics Building, Boston, Oct. 5-7.

NORTHEASTERN WOOD UTILIZATION COUNCIL, conference on "Chemistry and Utilization of Bock," Cambridge, Mass., Sept. 17.

PACKAGING MACHINERY MANUFACTURERS INSTITUTE, annual meeting, Hotel Commodore, N. Y. C., Oct. 12-13.

PORCELAIN ENAMEL INSTITUTE, 10th annual forum, University of Illinois, Urbana, Oct. 13-15.

SOCIETY OF THE PLASTICS INDUSTRY, Third National Plastics Exposition, Grand Central Palace, N. Y. C., Sept. 27-Oct. 1.

TEXTILE RESEARCH INSTITUTE, INC., annual general meeting, Waldorf-Astoria, N. Y. C., Nov. 18.

PERSONNEL

Company Officers

• Jesse L. Weinberg has been named secretary of FOOD RESEARCH LABORATORIES, INC. He will function as comptroller and general manager of the business affairs of the Laboratories and will have charge of personnel and public relations.

• WILLIAM I. MYERS, Dean of the New York State College of Agriculture at Cornell University, and acting chairman of the Federal Reserve Bank of New York, has been elected a director of U. S. Industrial Chemicals, Inc.

• The board of directors of MATHIESON CHEMICAL CORP. has elected Thomas S.

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A carefully refined terpene hydrocarbon, possessing exceptionally good solvent properties and designed for use in those products and processes which require a high quality Dipentene.

SPECIFICATIONS

	Max.	Min.	Typical Analysis
Specific Gravity 15.5C	0.855	0.845	0.852
Refractive Index 20C	1.477	1.472	1.474
Unpolymerized Residue	2.5%	.....	1.2%
ASTM Distillation			
Initial B. P.	.....	170C	170C
5%	.....	173C	174C
95%	185C	.....	182C

PROPERTIES

Solvent Power
Kauri Butanol: Approximately 70.
Aniline Point: Approximately —10C.
Mixed Aniline Point (N-Heptane) Approximately 33C.
Flash Point: Approximately 118F (Open Cup).

USES

CROSBY DIPENTENE is used as a special thinner for paints and varnishes, especially as an anti-skinning agent, also as a solvent in reclaiming rubber, as a diluent in perfumes, solvent for certain insecticides, in the manufacture of polyterpenes, synthetic resins and other chemical products.

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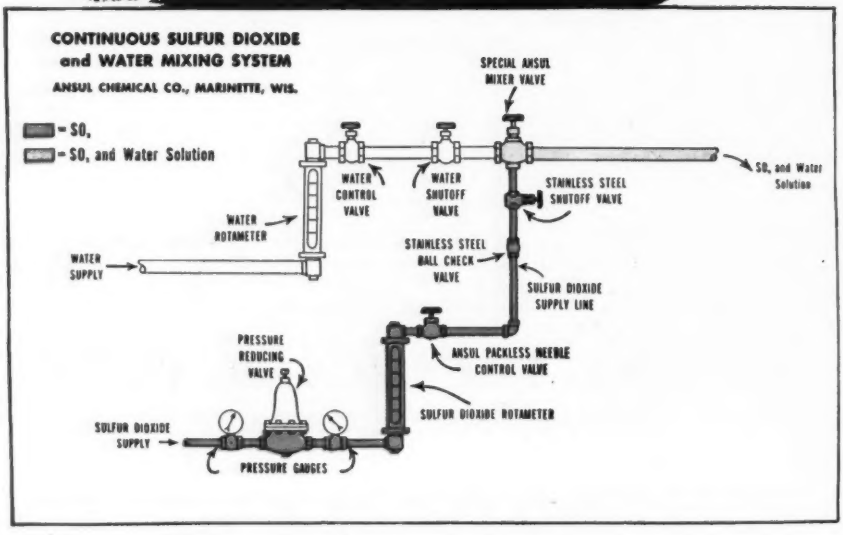
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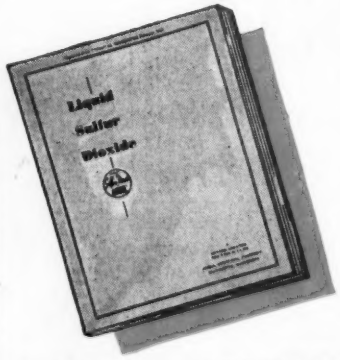
If you have need for an SO_2 mixing system for a specific application in your business, Ansul technicians will plan one for you.

LIQUID Sulfur Dioxide by ANSUL®

PHYSICAL PROPERTIES

Chemical formula	SO_2
Molecular weight	64.06
Color (gas and liquid)	Colorless
Odor	Characteristic, pungent
Melting point	−103.9° F. (−75.5° C.)
Boiling point	14.0° F. (−10.0° C.)
Density of liquid at 80° F.	(85.03 lbs. per cu. ft.)
Specific gravity at 80° F.	1.363
Density of gas at 0° C. and 760 mm.	2.9267 grams per liter (0.1827 lb. per cu. ft.)
Critical temperature	314.82° F. (157.12° C.)
Critical pressure	1141.5 lbs. per sq. in. abs.
Solubility	Soluble in water
Purity	99.9+% (by wt.) SO_2 (H_2O less than 0.01%)

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Nichols, president and chief executive officer, to the additional post of chairman of the board to succeed the late George W. Dolan. J. C. Leppart, vice president, was elected a member of the board to fill the vacancy caused by Mr. Dolan's death, and was appointed executive vice-president.

U. S. Rubber Appoints Stoneleigh



Duane R. Stoneleigh, named sales manager for agricultural sales for the United States Rubber Co. He will have offices in New York City and Naugatuck, Conn.

Production

• John M. Clark has been appointed assistant general manager of the Photo Products Department, the Du Pont Co. He succeeds Charles L. Wiswall, who has been appointed special assistant to the management.

• Monroe Rule is new manager in charge of operations at National Gypsum Co.'s Kimballton, Virginia, lime plant. He has been with National Gypsum since 1942.

• F. C. Peterson has recently been promoted to the position of production manager of the Cellulose Products Division of The Dow Chemical Co., Midland, Michigan,

He steps up from position of assistant manager of the division to replace Dr. W. R. Collings, vice-president and general manager of Dow Corning Corporation.

• J. M. Graham, Jr., has been named assistant director of Monsanto Chemical Co.'s General Engineering Department. He has been serving as manager of the department's process section, and will continue to direct the latter section.

Sales

• The Pennsylvania Salt Manufacturing Co. has promoted Walter W. Martens to the position of Eastern district

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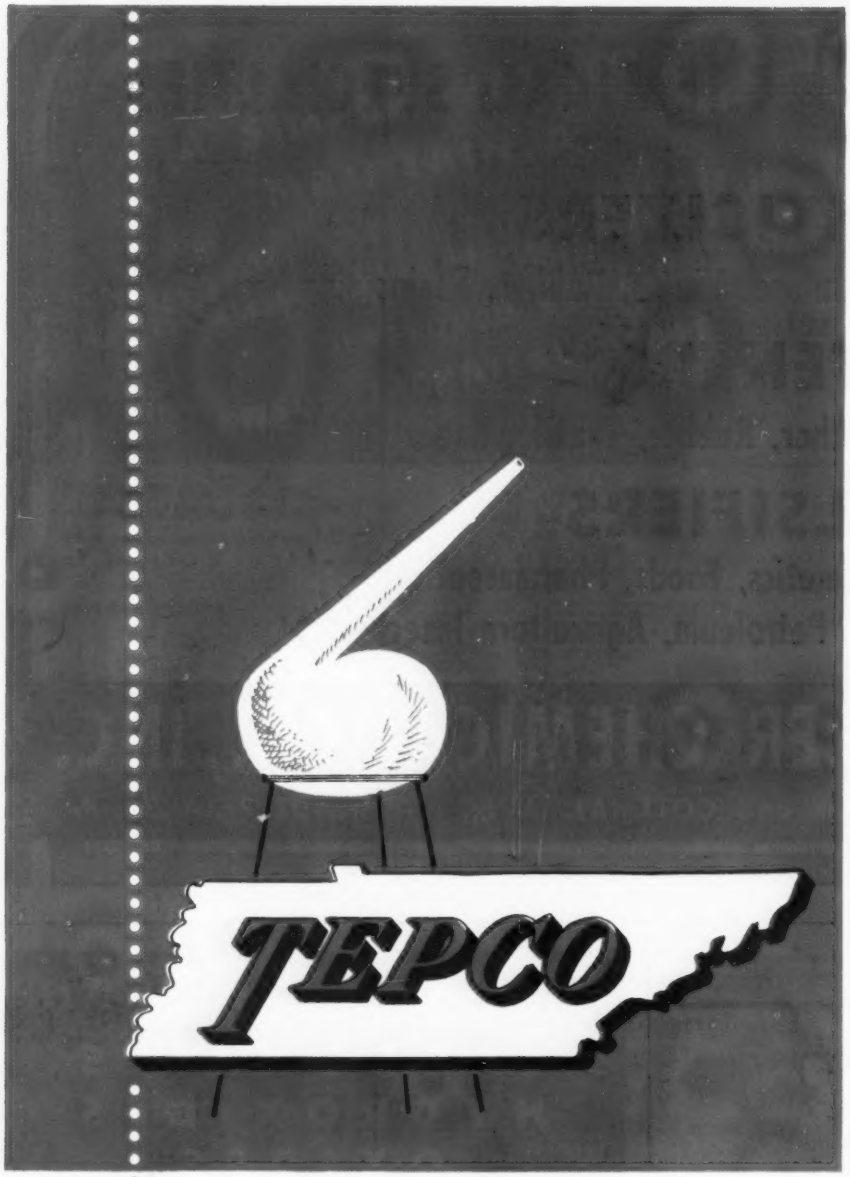
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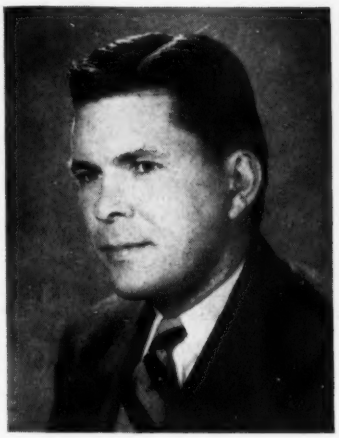
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sales manager for the Laundry and Dry Cleaning Division and has appointed four new sales service representatives in the division.

Diamond Alkali Names Clark



Henry B. Clark, new manager of the New York sales office, Diamond Alkali Co. He has been branch manager of the company's Boston sales office since 1946.

• All sales activities of the NYAL Co. have been placed under the direction of C. S. Aumack.

As sales manager, Mr. Aumack will supervise the 40 members of a newly reorganized selling staff.

• John B. Land has been named manager of sales for the Petroleum and Chemical Industries Section of GENERAL ELECTRIC's Materials Industries Division.

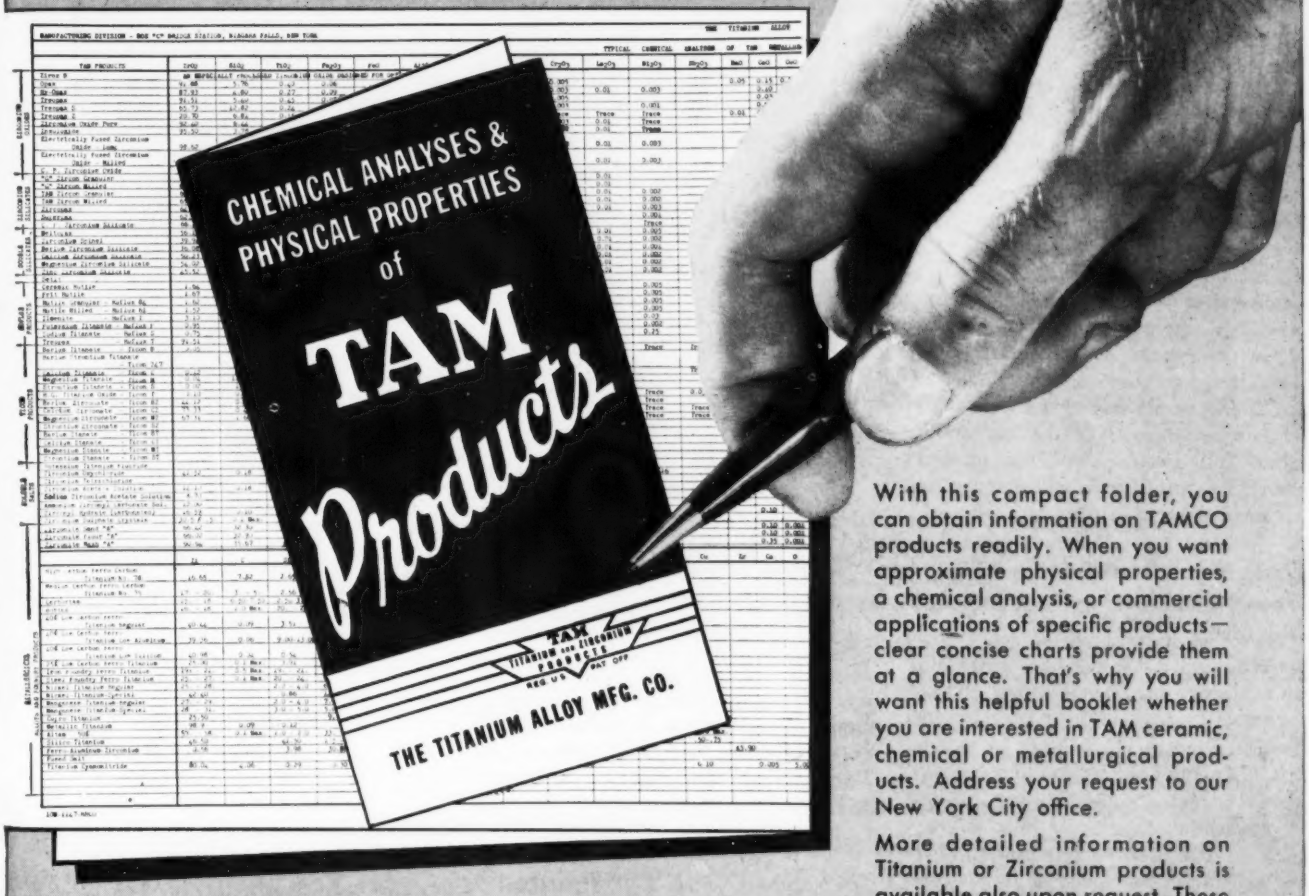
Previously he was connected with the Industrial Sales Division in G.E.'s Pittsburgh office.

• Robert M. Lowell is the newly appointed development chemist in charge of the development department at EDWAL LABORATORIES, INC. Prior to his association with Edwal, he was assistant superintendent of the pilot plant for synthetic rubber development with the Government Laboratory at the University of Akron.

• SWAN-FINCH OIL CORP. has promoted W. C. Bryant to the position of chief research chemist. For the past two years Mr. Bryant has been a group leader in the Research Department. Previously, he had spent eight years in the production division as a control and chief chemist.

• Louis B. Howard has resigned as chief of the BUREAU OF AGRICULTURAL AND INDUSTRIAL CHEMISTRY, U. S. Dept. of Agriculture and G. E. Hilbert, director of the Northern Regional Research Laboratory at Peoria, Ill., has been named to succeed him. Dr. Howard will head the recently formed Department of Food Technology in the College of Agriculture at the University of Illinois.

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CHEMICAL SPECIALTIES

A department devoted to news of the chemical specialties field. Descriptions of new specialty products will be found in the New Products & Processes department.

AIF Assn. Maps Organic Pesticide Study

An attempt to collect all available scientific data on the numerous new organic pest control chemicals will be made by an industry-government study committee organized by the Agricultural Insecticide and Fungicide Association. Scientists in the 48 state experiment stations and departments of agriculture, as well as federal officials, have been invited to submit copies of their reports on organics research.

Pointing out that the public has been bombarded with conflicting reports about the accomplishments and failings of the newer pesticides, L. S. Hitchner, executive secretary of the association, states that the committee's first task will be to determine just what problems have been created by the rapid introduction of the organic chemicals, and then attempt to solve these problems in the public interest. Meantime, first replies from public officials in all parts of the country indicate full awareness of the problems caused by scanty and sometimes wrong information on the new chemicals.

Drug Firm Awarded Navy Citation

Award of a certificate of achievement to Winthrop Chemical Co., now Winthrop-Stearns, Inc., manufacturer of pharmaceuticals, has been made by the Surgeon-General, U. S. Navy in recognition of "meritorious and outstanding services rendered to the Navy's Medical Department during World War II."

During the war Winthrop-Stearns was engaged in the production of antimalarials and other important drugs used in the treatment of such tropical diseases as African sleeping sickness, kala-azar, filariasis and schistosomiasis. The firm discovered a method of producing Atabrine on a commercial scale early in the war, and developed Aralen, an antimalarial considered more potent than Atabrine or quinine by the National Research Council.

Glidden Licenses Australian Firm

The Glidden Co. for a substantial down payment and royalty has licensed the Euston Lead Co., Ltd., of Australia, to use the Euston process for the manufacture of white lead. The Australian company has constructed a plant at Melbourne and will be in production by December or January.

Glidden, one of the country's largest producers of white lead, lithopone and titanium dioxide, owns exclusive rights to the Euston precipitation process which is said to yield a white lead of unusual uniformity, whiteness and purity. Other outstanding features claimed for this process are close control, reduction of health hazards to a minimum, and reduction of the process cycle of approximately 12 weeks to 24 hours.

Soap and Glycerine Producers Elect Peet



Roy W. Peet, elected manager of the Association of American Soap & Glycerine Producers. He is chairman of the American Fat Salvage Committee and was formerly vice-president of the Colgate-Palmolive-Peet Co.

Improved Anti-Ice Paint

An improved paint for preventing ice formation and accumulation on various surfaces, including aircraft propellers, is described by W. A. Palmer in U. S. Patent 2,431,885. Depending on the presence of free glycerine, this coating composition is prepared by mixing glycerine and phthalic anhydride in equal molecular proportions. These are heated together under specified conditions until a limited gelling occurs. Then an additional amount of glycerine, preferably about equal to the original amount, is incorportated and heating is continued until the desired end-point is reached. At this stage heating is discontinued but not the stirring.

When the mix cools sufficiently, alcohol or other volatile thinner is added to form a uniform dispersion. Usually the amount of thinner required is about 40 to 50 per cent by weight of the compound. In any case enough thinner must be used to permit easy spraying or brushing on the surface to be protected from icing. If applied to the surface in a heated condition, very little, if any, thinner is needed. Under service conditions, the free glycerine is retained in this coating for a considerable length of time.

Research on Mica

The Wet Ground Mica Association, Inc., New York City, has retained the Centro Research Laboratories, Inc., Briarcliff Manor, N. Y. to conduct a research program for the purpose of developing new and improved methods of utilizing the special characteristics of wet ground mica. In this way the producers of wet ground mica will help present and prospective users of the product to improve paints, varnishes, wallpaper, plastics and other materials with which wet ground mica can be used to advantage in formulations.

The Association would also appreciate the cooperation of those engaged in other research projects of which wet ground mica may be a part. Any such cooperation would be fully reciprocated and acknowledged.

Gerity-Michigan Markets New Line

Gerity-Michigan Corp. is test-marketing a new group of cleaning aids recently developed through an agreement with the Crosby Research Foundation. The cleaning aids, six in number, were tailored for specific jobs: glass, furniture, silver and chrome polishes, a foam cleaner and a liquid wax. Marketing will be on a country-wide scale through hardware stores, groceries, and other usual outlets for similar products.

Environment Influences 2,4-D Effectiveness

The residual effects of 2,4-D in soil treated for weed elimination vary according to environment. This has been determined by Carl J. C. Jorgensen and C. L. Hamner, Michigan State College horticulturists.

Three chemically different forms of 2,4-D were used to treat soil which had been inoculated with weed seed containing more than 20 kinds of weeds, grass, and clover. Some of the treated flats of soil were kept in the greenhouse, some were placed outside, and others were put under cold storage conditions. At intervals varying from one to eight weeks after treatment, 10 seeds each of sweet corn, garden pea, and radish were planted in designated flats.

Results showed that soils treated with 8 or 16 parts per million of 2,4-D before

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Edited by

RICHARD M. LAWRENCE
Development Department
Monsanto Chemical Co.

You readers of Chemical Industries asked for this. You wrote us many letters requesting that we reprint our series on information sources for chemical market research and we are glad to be able to announce that the book is now off the press.

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weed seeds had germinated were virtually weed-free. The various temperatures made no difference in the effectiveness of 2,4-D as a weed killer, but the soil remained toxic to economic crops longer at freezing or subfreezing temperatures. Difference in acidity, in the organic matter in the soil, and in the moisture content of the soil, greatly affected the value of 2,4-D as a soil treatment for weed control. On the other hand, the acidity did not greatly affect the rate at which toxicity was lost from the soil.

Continuing further, the specialists report that sodium 2,4-D disappeared from water-saturated flats in three weeks, but was still present in air-dry flats after 8 weeks. Because of this, it is pointed out that it would be unwise to use 2,4-D during periods of drouth or in drouthy regions without recognizing this factor. Eight parts per million of sodium 2,4-D were ineffective in killing weed seeds in muck. Corn was more highly resistant to 2,4-D materials under all conditions than either peas or radishes.

Kem-Lustral Enamel Line Back

Due to improved raw material supply the complete line of Kem Lustral industrial enamels has been reinstated, it has been announced by the Sherwin-Williams Co. This line of synthetic enamel is available in 24 colors, including black, gloss white and semi-gloss white, which give industrial users a selection that will meet nearly every color requirement.

Package sizes are one gallon, five gallons, and drums. The entire range of colors is now in production and is available for early delivery through S-W branches.

Simple Determination of Quaternary Strength

The approximate concentration of quarternary germicide in use-solutions in commercial and industrial applications can be determined simply, effectively and economically by the paper of Fairfield Laboratories, Inc., Plainfield, N. J. and its subsidiary, Rhodes Chemical Corp.

This indicator paper, sensitive from 40 to 3,000 p.p.m. of quarternary germicide solution, is immersed in the solution to be tested for 15 seconds. By comparison with color standards on the chart supplied with the test paper, the active residuum of a use-solution is determined. This method is suggested for adequate bacteriological control of utensils and food processing equipment.

For ascertaining the approximate strength in p.p.m. of the use-solution, the Portley titration method is recommended. This consists of dipping a piece of the Portley indicator test paper into the quaternary solution for 15 seconds. After removing the excess quaternary solution, the wet paper is placed in a calibrated glass vial containing 10 cc. of tap water. The use of the titrating solution, added drop by drop to the water in the vial, producing a change in color of the paper completes this test.

Portley indicator test paper is available in 15 foot rolls, together with a dispenser for which refills may also be obtained, or in envelopes containing 2" x 2" perforated test paper sheets. A color chart is supplied with each of these. The titrating fluid may be had in 8 or 16 ounce bottles with which ½ ounce dropper bottle is furnished. There is a complete test set, containing a dispenser with a 15 foot roll of paper, a ½ ounce dropper bottle of titrating fluid and a calibrated vial.

BHC Gives Complete Tick Control

Benzene hexachloride should be added to the sprays used for complete tick control advises D. E. Howell, Oklahoma A. and M. College entomologist.

The benzene hexachloride when used alone will give more immediate control but will be effective for only a short period of time. The period of tick control will be extended for a much longer time if the benzene hexachloride is mixed with either DDT, chlorinated camphene or methoxychlor.

A 0.5 per cent mixture of the spray which will not kill the full-grown ticks when used exclusively should be mixed with 4 lbs. of 6 per cent gamma benzene hexachloride (equal to .03 per cent gamma content) to each 100 gallons of spray.

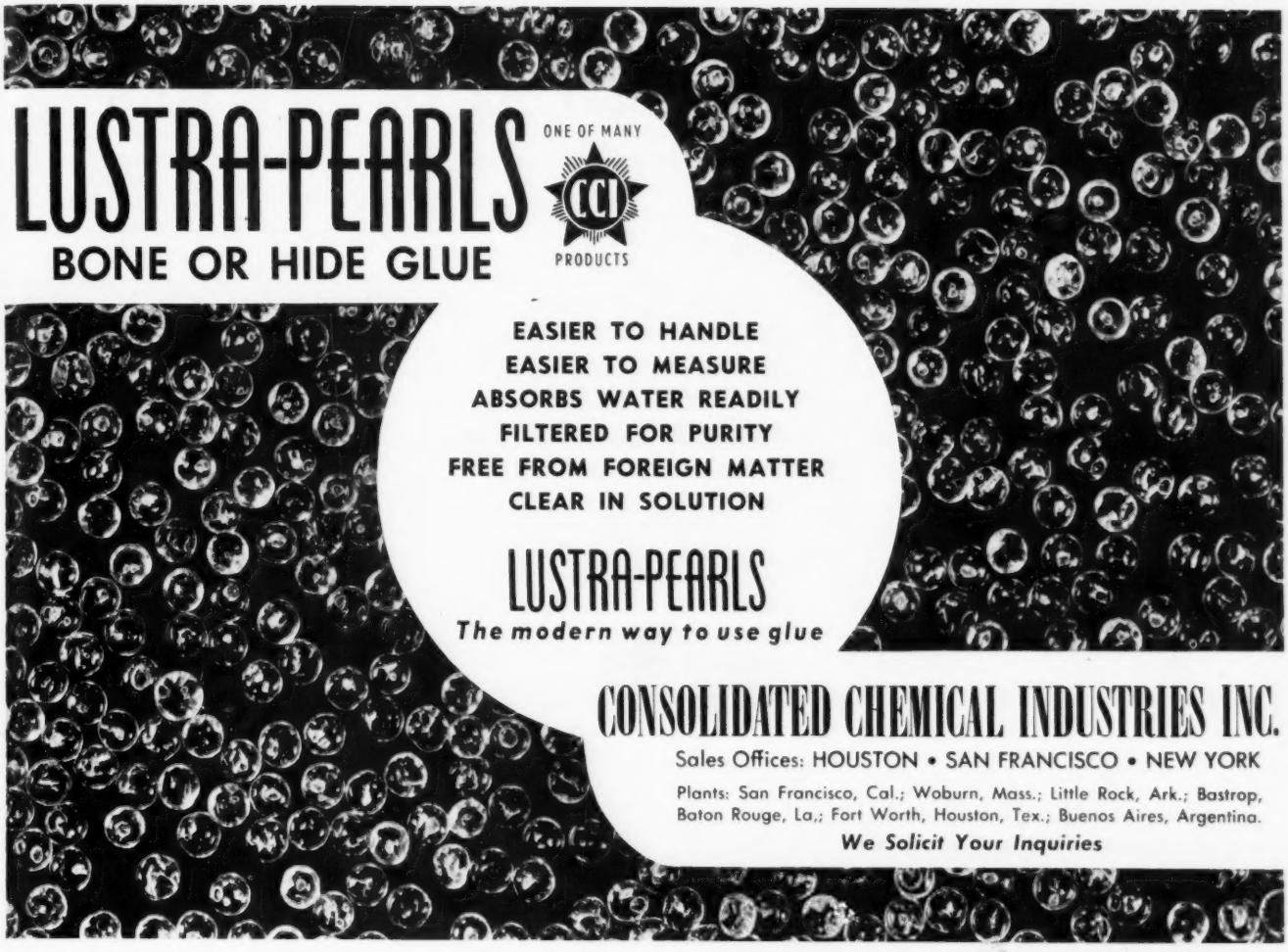
A larger amount of benzene hexachloride is not advised by Dr. Howell for use on cattle as the quality of the milk may be harmed. The spraying should be done several hours before milking or slaughtering.

The chlorinated camphene, DDT and methoxychlor will give about the same control when animals are sprayed at two to three weeks intervals. The chlorinated camphene, however, was found to cost the least.

Tests to Assay Senna

Senna, one of the oldest botanical medicines in the world, has been subjected to new tests, which prove its potency can be assayed and demonstrated that preparations containing it may now be standardized and requirements established in official compendia.

The tests on both laboratory animals and humans were completed at the Sterling-Winthrop Research Institute, Rensselaer, N. Y., and the first report on them was presented before the American Pharmaceutical Association in San Francisco by Lloyd C. Miller, director of the Institute's biology division.



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CHEMICAL MARKETS

Upward Production Trend For Coast Chemicals

Production of inorganic chemicals in the eleven western states in 1947 shows a decided increase over 1946, according to a survey of the Industrial Department of the San Francisco Chamber of Commerce.

Using figures prepared for the Chamber by the U. S. Bureau of the Census, the survey shows an increase in production of solid carbon dioxide, chlorine, hydrogen, nitric acid, oxygen, natural soda ash, sodium hydroxide and sulphuric acid.

Biggest production increase was in sulphuric acid which jumped from a total of 588,336 short tons in 1946 to 749,252 short tons in 1947, a gain of 160,916.

Only chemical to show a decrease was liquid and gas carbon dioxide which dropped from a total of 12,361 pounds in 1946 to 11,466 pounds in 1947, a difference of 895 pounds.

The Chamber report covered the states of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming.

Oxygen Demand Increasing

From production figures of "high purity" oxygen it can be seen that demand for that material is steadily increasing. During April 1948, 1,362 million cubic feet were produced as against 1,146 million cubic feet during April 1947. Production for the month of April 1948 was the highest of any month since April 1945. Considerable new capacity will be available in the near future. In addition, there is a growing demand for the so-called "tonnage" low-purity oxygen for the petroleum gas, steel, and chemical industries.

Cyclic Crudes Expected To Maintain Levels

United States production of cyclic crudes in 1948, barring further labor interruptions, generally is expected to approximate that of 1947, according to the Department of Commerce. Effects of the bituminous coal work stoppage on coal chemicals production was practically dissipated by the end of the second quarter.

Imports of these commodities are being reestablished and sizable amounts of creosote, naphthalene, cresols, and cresylic acid were received during the second quarter.

Current demand is sufficient to absorb all available supplies. With the exception of naphthalene, the present supply situation, although not in balance with demand, is easier than earlier in the year. Supplies of naphthalene may increase as much as 20 per cent if production and imports continue at second quarter levels. However, increased imports at lower than United States prices coupled with the short supply and high cost of fuel oil could tend to curtail the output of the tar distillers.

Record for Natural Sodium Salts in 1947

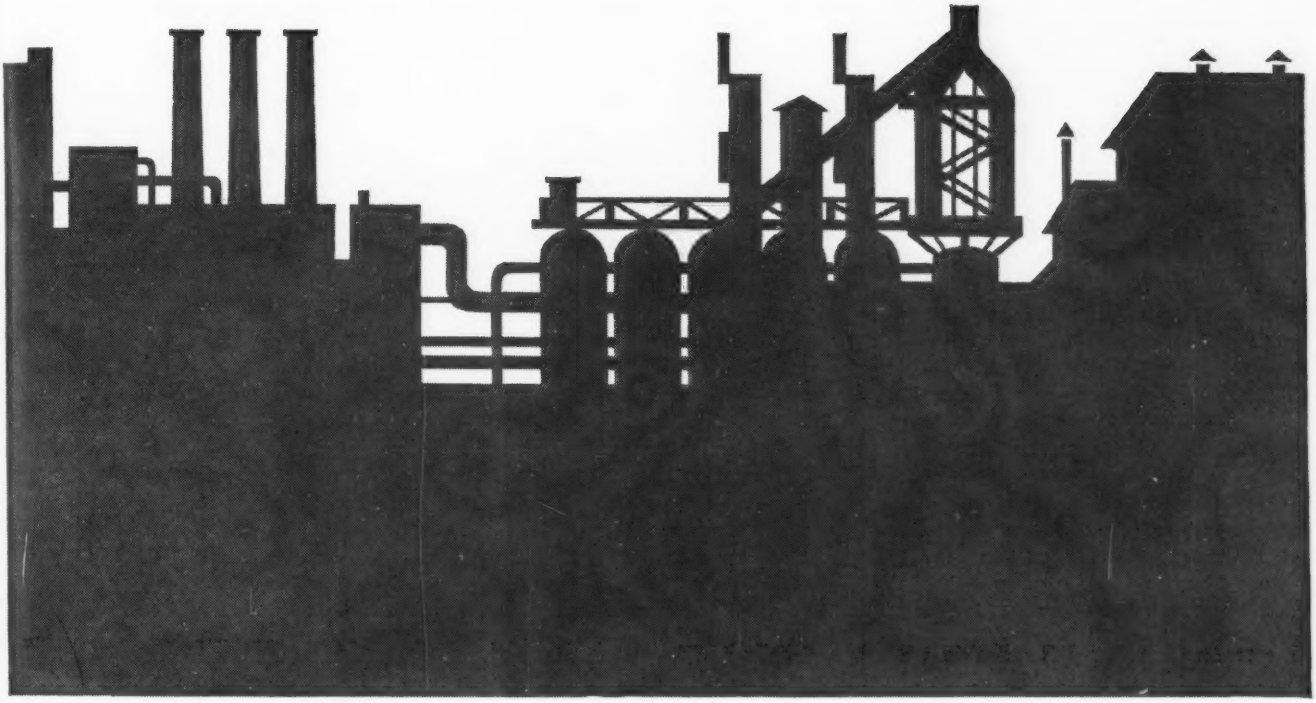
Reports of producers of natural sodium sulfates and carbonates to the Bureau of Mines should be of particular interest to the great number of exporters making inquiries about natural soda ash which can be exported in reasonable quantity without restriction. The firms reporting production of natural sodium carbonates in 1947 were the following: American Potash & Chemical Corp., Trona, Calif.; Natural Soda Products Co., Central Tower Bldg., San Francisco 3, Calif., plant at Keeler; Permanente Metals Corp., Kaiser Bldg., Oakland, Calif., plant at Lone Pine; Pittsburgh Plate Glass Co., Columbia Chemical Division, Bartlett, Calif.; and West End Chemical Co., Latham Square Bldg., Oakland 12, Calif., plant at Westend.

Production of both sulfates and carbonates was at record heights. In 1947, 257,294 short tons of sodium sulfates valued at $3,328,094 were produced as compared with 1946 production of 198,781 short tons worth $1,695,413. Natural sodium carbonate production in 1947 was 293,051 short tons valued at $5,826,178 as compared to 215,625 short tons ($3,427,178 value) in 1946.

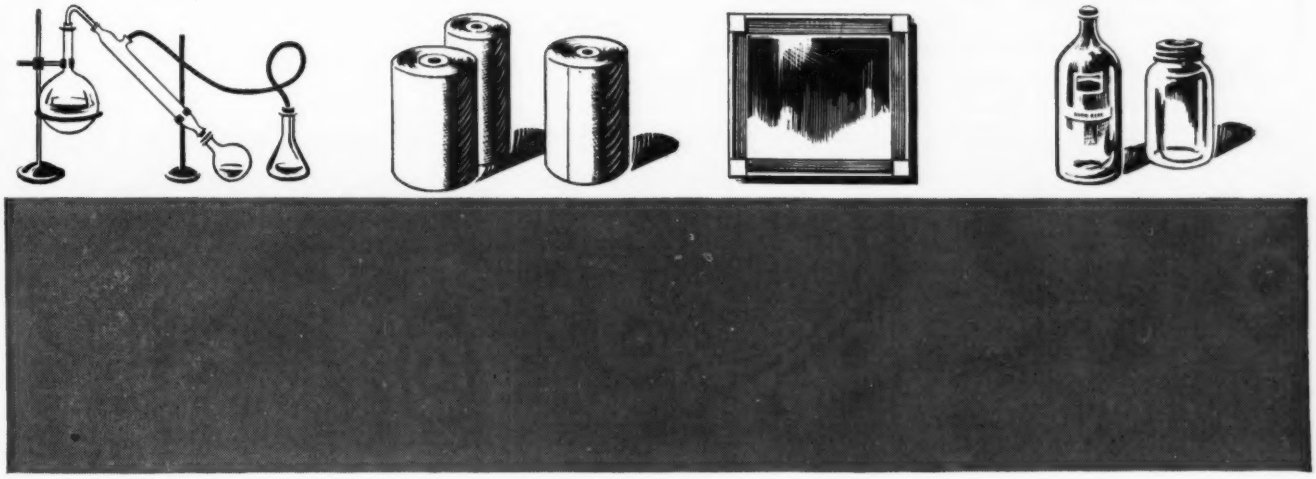
Naval Stores Support Fund Low

Indications are that the $7.5 million allotted by the Commodity Credit Corporation for the gum naval stores price support program for the 1948 year that began April 1 may be insufficient. It was recently estimated that about $5 million already had been used, and that the high rate of loan applications could exhaust the fund.

When estimates of the needs of the current year were made in April, a unit support price of $131.58 was set to give a price of about 60 cents a gallon for gum turpentine and a little over $7.00 per hundredweight for the middle grades of gum rosin. While the fund set aside for this plan was felt to be adequate, it did



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This basic chemical is of vital importance to the glass, pulp and paper, non-ferrous metals and chemicals industries. Without Soda Ash in vast tonnages, many industries would close their doors.

Ever since the founding of Wyandotte Chemicals Corporation in 1890, one of the company's major efforts has been to insure a continuous supply of Soda Ash to meet the tremendous demand.

In line with this objective, Wyandotte has made good progress on plans for increasing the production of this and other essential alkalies. Equipment has been placed to pump *each day*—aside from brine—15,000,000 *more* gallons of water . . . to quarry *each year*, 120,000 *more* tons of limestone. Multi-ton lime kilns, distillers, carbonators and absorbers are also being constructed.

Wyandotte is planning, building, working toward a goal of more Soda Ash to fill industry's needs.

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Soda Ash • Caustic Soda • Bicarbonate of Soda • Calcium Carbonate • Calcium Chloride • Chlorine • Hydrogen • Dry Ice • Glycols
Ethylene Dichloride • Propylene Dichloride • Chloroethers • Aromatic Sulfonic Acid Derivatives • Other Organic and Inorganic Chemicals

Wyandotte
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not reckon with the cut in the price of turpentine going into the loan to 40 cents. This automatically forced the price of the middle grades of rosin up close to $8.00 per hundredweight (to maintain the unit price at $131.58). This more attractive price for rosin caused it to flow into the government storage at a rapid rate, with the resultant depletion of the fund.

Past experience has shown that the CCC has had to revise its appropriations for this program before, and this can be done again by the CCC's withdrawing the money from its revolving account. The Congress must by law restore this agency's revolving account each fiscal year, just as by law the agency returns to the U. S. Treasury any money it makes on its support program. It is expected that more money will be earmarked for naval stores.

Tag Sales at All-Time High

Sales of fertilizer tax tags in 15 states reached a record high in the recently completed fiscal year, according to reports of state control officials to The National Fertilizer Association. For the year ended June 30, such sales were equivalent to 9,516,000 short tons; this represented an increase of nine per cent over the 8,722,000 tons reported for the 1946-47 fiscal year, when sales were at a record high, and 18 per cent over the 8,087,000 tons registered for the 1945-46 fiscal year.

Market Review

Summer made itself felt in the chemical industry as dullness characterized the market scene. Many plants were shut down for vacations, and in general there was a decline in demand. There were quite a few days when nothing of much importance occurred, as price adjustments to bring producers' schedules in line with the competitive situation in the market were the only activities. No great fears were expressed because of this seasonal decline, and it was felt that low inventories resulting from the hand-to-mouth purchasing practices, and demands occasioned by the ECA would see spirited buying in the fall.

Hope for future imports of caustic soda was raised with the arrival of some 5,000 drums of the material from Leghorn, Italy. Although it was first believed to be sold at 6¢ a pound, most of it went at from 8½¢ to 9¢ per pound. The possibility of additional tonnage from Italy, France, and Belgium is of interest in the light of the OIT's estimate of native supplies of caustic soda and soda ash for the remainder of the year: supplies will be adequate for domestic consumers, although tight.

Among adjustments were advances in the prices of coal tar chemicals by a major producer. A 3¢ change brought the range for phthalic anhydride to 21½¢ and 23½¢ a pound for carlot and less than carlot prices respectively. Other increases: maleic anhydride, 2½¢ per pound; tricresyl phosphate, 9¢ a pound and triphenyl phosphate, 2¢ a pound. A gloomy outlook prevailed when the Dow plant was out, as supplies of phenol tightened. With the settlement of the strike it was expected that some of pessimism would be lessened. Some consumers also complained of their inability to find required amounts of naphthalene. Benzol, toluol and xylol increases brought benzol to 20¢ to 21¢ f.o.b. ovens, while the other two ranged between 23¢ and 27¢ depending on the source. September 1 was the scheduled date for Monsanto to boost phenol ½¢ to 12½¢ a pound in tank cars. Higher cost of benzol was the reason.

The more available non-volatile antifreezes, diethylene glycol and propylene glycol, were being sought by anti-freeze manufacturers who could not find sufficient ethylene glycol.

GUMS:

GUM ARABIC
GUM ARABIC BLEACHED
GUM GHATTI
GUM KARAYA (Indian)
GUM TRAGACANTH
GUM EGYPTIAN
GUM LOCUST (Carob Flour)
QUINCE SEED

★

CASEIN

SPECIALTIES:

MENTHOL (Crystals)

★

TARTARIC ACID

★

CREAM OF TARTAR

★

EGG ALBUMEN
EGG YOLK
BLOOD ALBUMEN

★

JAPAN WAX
CANDELILLA WAX

GUMS
(CRUDE, POWDERED)
Chemicals and Oils



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ST. LOUIS: H. A. BAUMSTARK & CO.
LOS ANGELES: JOHN A. HUGHES

Packaging & Shipping

(*Continued from page 496*)

254B (a) Compounds, cleaning, liquid, containing not more than 60 percent hydrofluoric acid, must be packed in specification containers as follows:

(b) As prescribed in sec. 264(c).

(c) Spec. 12B.—Fiberboard boxes with inside containers of India rubber, ceresine, lead, or other material of equal strength and not subject to destruction by the lading.

The reason for this addition was to provide proper packing for this commodity.

Section 261A (*Formic acid*) was amended as follows:

(Add) (h) Spec. 17H.—Metal drums (single-trip) equipped with bag type liners of material and construction approved by the Bureau of Explosives. Each drum must have two diametrically opposite vent holes ¼ inch diameter in the side wall at each end in close proximity to the top curl and bottom chime. Interior of welded side seam must be covered or otherwise treated to provide a non-abrasive surface.

The reason for this amendment was to provide a single-trip metal drum for formic acid shipments which was developed after exhaustive tests.

Section 266 (Hydrogen peroxide), paragraph (b)(4) was amended as follows:

(b)(4) Spec. 42D.—Aluminum drums with vented closure in top head; not over 55 gallons capacity. Closure must be sealed to prevent removal in transit and top head plainly marked "KEEP THIS END UP" or "KEEP PLUG UP TO PREVENT SPILLAGE." Aluminum drums of not over 30 gallons capacity already in service for the transportation of this material, manufactured prior to April 24, 1934, and of at least equal strength and efficiency as drums of like capacity authorized under Spec. 42D, may be continued in use until further order of the Commission.

The reason for this amendment was to provide a larger refillable container for shipments of hydrogen peroxide containing not over 52 percent H_2O_2 strength by weight due to increased demand for this material.

(*The amendments to the ICC Rules and Regulations will be continued in a subsequent issue.*—EDITOR.)

Ready to Serve—

Aqua Ammonia
Anhydrous Ammonia
Yellow Prussiate of Soda
Calcium Ferrocyanide
Calcium Chloride
Ammonium Ferrocyanide

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FOR SALE: Warehouse and tank farm, 200,000 gallon bulk storage. Some tanks insulated and coiled, heated by automatic boiler house. All facilties for unloading tankcars, loading tankwagons, drum filling, and large truck high platform with six car siding. Located in New Jersey, eight miles from New York City. Suitable for heavy and light petroleum products. Box 4149, Chemical Industries, 522 Fifth Ave., New York 18, N. Y.



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Hi-Flash solvent

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*Cleveland	Cherry 5943	*Philadelphia	Jefferson 6-3000
*Detroit	Vinewood 2-2500	*St. Louis	Lockhart 6510
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CURRENT PRICES

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Important chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.

Purchasing Power of the Dollar: 1926 Average—$1.00
August, 1946, $0.767 *August, 1947, $0.61*
August, 1948, $0.568

	Current Low	Current High	1948 Low	1948 High	1947 Low	1947 High
Acetaldehyde, 99%, drs wks lb.	.11	.12	.11	.12	.11	.15
Acetic Anhydride, drs, c.l., frt. all. E lb.	.13	.14½	.13	.14½	.11½	.14½
Acetone, tks, delv lb.	.07	.09	.07	.09	.07	.09
ACIDS						
Acetic, 28% bbls 100 lbs.	3.78	4.08	3.78	4.08	3.38	4.08
Glacial, synthetic C. P., drs, wks 100 lbs.	13.50	14.00	13.50	14.00	13.50	14.00
Acetylsalicylic, Standard USP lb.	.45	.59	.45	.59	.45	.59
Benzoic, tech, bbls lb.	.43	.47	.43	.47	.43	.47
USP, bbls, 4,000 lbs. up lb.	....	.54	....	.54	....	.54
Boric tech, bbls. c-l, frt. split tons	....	124.00	....	124.00	....	124.00
Chlorosulfonic, drs, wks lb.	.03	.04½	.03	.04½	.03	.04½
Citric, USP, crys, gran, bbls lb. *b*	.22	.27½	.22	.27½	.20	.23
Cresylic 50%, 210-215° low boil 50%, drs, wks, frt, equal gal.	1.26	1.61	1.26	1.61	1.01	1.26
Formic, 85%-90% cbys lb.	.12	.14½	.12	.14½	.10	.14½
Hydrofluoric, 30% steel, drs lbs.	.08	.09	.08	.09	.08	.09
Lactic, 22%, bbls, c.l., wks 100 lbs.	....	5.80	....	5.80	....	4.40
44%, light, bbls, wks 100 lbs.	8.15	10.95	8.15	10.95	7.30	8.55
Maleic, Anhydride, drs lb.	.25	.31	.25	.31	.25	.26
Muriatic 18° cbys 100 lbs.	1.50	2.90	1.50	2.90	1.50	2.90
20° cbys, c-l, wks 100 lbs.	1.85	2.00	1.85	2.00	1.85	2.00
22° cbys, c-l, wks 100 lbs.	2.35	2.50	2.35	2.50	2.35	2.50
Nitric, 36°, cbys, wks 100 lbs. *c*	5.00	6.30	5.00	6.30	5.00	6.30
38°, c-l, cbys, wks 100 lbs. *c*	2.35	5.50	2.35	5.50	....	5.50
40°, c-l, cbys, wks 100 lbs. *c*	6.00	6.50	6.00	6.50	....	6.50
42°, c-l, cbys, wks 100 lbs. *c*	6.50	7.00	6.50	7.00	....	7.00
Oxalic, bbls, wks lb.	.13	.14½	.13	.14½	.11¾	.14
Phosphoric, 100 lb. cbys, USP lb.	.10½	.13	.10½	.13	.10½	.13
Salicylic tech, bbls lb.	.31	.38	.31	.38	.26	.42
Sulfuric, 60°, tks, wks ton	12.25	13.50	12.25	13.50	....	13.50
66°, tks, wks ton	15.00	17.50	15.00	17.50	....	17.50
Fuming 20%, tks, wks ton	18.00	20.50	18.00	20.50	....	20.50
Tartaric, USP, bbls lb.	.41½	.50	.41½	.50	.49½	.55
Alcohol, Amyl (from Pentane) tks, delv lb.	.17	.25	.17	.25	....	.25
Butyl, normal, syn, tks lb.	....	.17	....	.17	....	.17
Denatured, CD, proprietary solvent gal. *d*	.87½	1.08½	.87½	1.08½	1.00½	1.03
Ethyl, 190 proof tks gal.	17.85	18.13	17.85	18.13	18.04	18.08
Isobutyl, ref'd, drs lb.	....	.13	....	.13	....	.13
Isopropyl ref'd, 91% dms gal.	.44	.50½	.44	.50½	.41	50½
Alum, ammonia, lump, bbls, wks 100 lbs.	4.05	4.25	4.05	4.25	....	4.25
Aluminum, 98.99% 100 lbs.	15.00	16.00	15.00	16.00	15.00	16.00
Chloride anhyd, l.c.l. wks. lb.	....	.12½	....	.12½	....	.10¼
Hydrate, light, bgs lb.	....	.17	....	.17	....	.17
Sulfate, com'l. bgs, wks, c-l 100 lbs.	1.15	1.30	1.15	1.30	1.15	1.30
Sulfate, iron-free, bgs, wks 100 lbs.	1.95	2.50	1.95	2.50	1.75	2.50
Ammonia anhyd. cyl lb.	.16	....	.16	....	.14½	.20
Ammonia, anhyd, frt, tank cars, wks, frt, equalized ton	59.00	70.00	59.00	70.00	....	59.00
Ammonium Carbonate, USP lumps, drs lb.	.08¼	.19	.08¼	.19	.08¼	.19
Chloride, USP, bbls, drms, kgs lb.	.13	.15	.13	.15	.13	.15
Nitrate, tech, bgs, wks lb.	.0213	.0225	.0213	.0225	.0218	.0225
Oxalate pure, grn, bbls lb.	.23	.29	.23	.29	.23	.29
Perchlorate, kgs lb.	.25	....	.25	....	.24	.25
Phosphate, dibasic tech, bgs lb.	.07	.07¾	.07	.07¾	.07	.07¾
Stearate, anhyd, drs lb.	....	.34	....	.34	....	.34
Sulfate, drs, bulk ton	30.00	45.00	30.00	45.00	30.00	38.00

USP $25 higgher; Prices are f.o.b. N. Y., Chicago, St. Louis, deliveries ½c higher than NYC prices, *a* Powdered boric acid $5 ton higher; *b* Powdered citric acid is ½c higher; *c* Yellow grades 25c per 100 lbs. less in each case; *d* Prices given are Eastern schedule.

Current Prices

Amyl Acetate Gums

		Current		1948		1947	
		Low	High	Low	High	Low	High
Amyl Acetate (from pentane) tks, delv	lb.	.21	.29	.21	.29	.21	.24
Aniline, Oil, dms	lb.	.13	.15	.13	.15	.12	.14
Anthraquinone, 99.5%, bbls	lb.	.70	.80	.70	.80	....	.70
Antimony Oxide, bgs	lb.	.26	.32	.26	.32	.21	.31
Arsenic, whl, bbls, powd	lb.	.06	.08	.06	.08	.05	.08
Barium Carbonate precip, wks, bgs	ton	67.50	82.00	67.50	82.00	60.00	82.00
Chloride, tech, cryst, bgs, zone 1	ton	85.00	95.00	85.00	95.00	73.00	95.00
Barytes, floated, paper bgs	ton	....	33.30	....	33.30	....	41.95
Bauxite, bulk mines	ton	8.50	10.00	8.50	10.00	7.00	10.00
Benzaldehyde, tech, cbys, drs	lb.	.45	.55	.45	.55	.45	.55
Benzene (Benzol), 90%, tks, frt all'd	gal.	.19	.21	.19	.21	.19	.21
Benzyl Chloride, cbys	lb.	.19	.28	.19	.28	.20	.28
Beta-Naphthol, tech, bbls, wks	lb.	.23	.30	.23	.30	.21	.29
Bismuth metal, ton lots	lb.	....	2.00	....	2.00	....	2.00
Blanc Fixe, 66⅔ Pulp, bbls, wks	ton	55.00	65.00	55.00	65.00	40.00	60.00
Bleaching Powder, wks	100 lbs.	2.75	4.75	2.75	4.75	2.50	3.75
Borax, tech, c-l, bgs	ton	48.50	76.00	48.50	76.00	45.00	56.00
Bordeaux Mixture, bgs	lb.	.15	.23	.15	.23	.11	.23
Bromine, cases	lb.	.21	.23	.21	.23	.21	.23
Butyl, acetate, norm, dms	lb.	.30½	.36½	.30½	.36½	.26	.33½
Cadmium Metal	lb.	1.75	1.90	1.75	1.90	....	1.80
Calcium, Acetate, bgs	100 lbs.	3.00	4.00	3.00	4.00	3.00	4.00
Carbide, drs	ton	50.00	140.00	50.00	140.00	50.00	90.00
Chloride, flake, bgs, c-l	ton	21.50	38.00	21.50	38.00	18.50	38.00
Solid, 73-75% drs, c-l	ton	20.00	37.50	20.00	37.50	18.00	37.50
Gluconate, USP, bbls	lb.	.58	.65	.58	.65	.57	.65
Phosphate tri, bbls, c-l	lb.	6.50	6.80	6.50	6.80	6.50	6.80
Camphor, USP, gran, powd, bbls, 2,000-lb. lots	lb.	.66	.78	.66	78	.75	.82
Carbon Bisulfide, 55-gal. drs	lb.	.05	.05¾	.05	.05¾	.05	.05¾
Dioxide, cyl	lb.	.06	.08	.06	08	.06	.08
Tetrachloride, Zone 1, 52½ gal. drs	lb.	.06½	.07½	.06½	.07½	.06	.07
Casein, Acid Precip, bgs, 10,000 lbs. or more	lb.	.30	.35	.30	.35	.26	.35
Chlorine, cyls, lcl, wks, contract	lb.	.07	.15½	.07	.15½	. ¾	.10½
Liq, tk, wks, contract	100 lbs.	....	2.25	....	2.25	....	2.30
Chloroform, tech, drs	lb.	.20	.23	.20	.23	.20	.23
Coal tar, wks, crude, dms, c-l, wks	dm.	....	10.60	....	10.60	....	10.60
Cobalt, Acetate, bbl	lb.	....	.83¾	....	.83¾	....	.83¾
Oxide, black kgs	lb.	1.275	1.80	1.275	1.80	....	1.30
Copper, metal	100 lbs.	21.50	23.50	21.50	23.50	21.50	24.00
Carbonate, 52-54%, bbls	lb.	.24	.26	.24	.26	.19½	.26½
Sulfate, bgs, wks cryst.	100 lbs.	7.60	8.10	7.60	8.10	7.10	8.60
Copperas, bulk, c-l, wks	ton	....	14.00	....	14.00	....	14.00
Cresol, USP, drs	lb.	.14	.19¼	.14	.19¼	.13¾	.15¾
Dibutylamine, c-l, drs, wks	lb.	.52½	.76	.52½	.76	....	.76
Dibutylphthlate, drs	lb.	.32	.38½	.32	.38½	.29	.38½
Diethylaniline, drs	lb.	....	.69	....	.69	....	.48
Diethylene glycol, drs, wks	lb.	.14	.16½	.14	.16½	.14	15
Dimethylaniline, drs, cl., lcl	lb.	.21	.26¾	.21	.26¾	.20	24¼
Dimethylphthalate, drs	lb.	.23½	.27½	.23½	.27½	.20	.24¾
Dinitrobenzene, bbls	lb.	.16	.21¾	.16	.21¾	....	.16
Dinitrochlorobenzene, dms	lb.	.14	.17	.14	.17	.14	.15½
Dinitrophenol, bbls	lb.	....	.26¾	....	.26¾	....	22
Dinitrotoluene, refd., drs	lb.	....	.18	....	.18	....	18
Diphenyl, bbls, lcl, wks	lb.	.15	.20	.15	.20	.15	20
Diphenylamine, bbls	lb.	....	.25	....	.25	....	25
Diphenylguanidine, drs	lb.	.35	.37	.35	.37	.35	.37
Ethyl Acetate syn. 85-90%, tks, frt. all'd	lb	.09½	.16	.09½	.16	.09½	.12
Chloride, USP, bbls	lb	.20	.22	.20	.22	.18	.22
Ethylene Dichloride, lcl, wks, E. Rockies, drs	lb.	.08½	.09½	.08½	.09½	.08½	.09½
Glycol, dms, cl.	lb.	....	.15	....	.15	....	.12
Fluorspar, No. 1, grd. 95-98% bulk, c-l mines	ton	....	45.50	....	45.50	....	37.00
Formaldehyde, bbls, cl & lcl	lb	.0645	.0745	.0645	.0745	.0520	.0745
Furfural tech, tks	lb.	.09½	.13	.09½	.13	....	.13
Fusel Oil, ref'd, drs, dlvd	lb.	.26½	.29½	.26½	.29½	.18½	.29½
Glauber's Salt, Cryst, bgs, wks	100 lbs.	1.25	1.75	1.25	1.75	1.05	1.75
Glycerine dynamite, drs, c-l	lb.	.39½	.40¼	.39½	.40¼	.29½	.75¾
Crude Saponification, 88% to refiners tks	lb.	.23	.32	.23	.32	.23	.60

GUMS								
Gum Arabic, amber sorts bgs	lb.	.14	.15	.14	.15	.13¾	.15
Benzoin, Sumatra, cs	lb.	.40	.45	.40	.45	.50	1.00
Copal, Congo No. 1, bgs	lb.	.25	.29	.25	.29	.26	.29
Copal, East India, chips	lb.	no prices		no prices		no prices	
Macassar DBB, bgs	lb.	.21	.25	.21	.25	.24	.25
Copal Manila	lb.	no prices		no prices		.25	....
Karaya, bbls, bxs, drs	lb.	.20	.51	.20	.51	.20	.55

ABBREVIATIONS—Anhydrous, Anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less than carlots, lcl; drums, drs; kegs, kgs; powdered, pwd; refined, ref'd; tanks, tks; works, f.o.b., wks.



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Further information given without obligation.

Current Prices

Gums Saltpeter

		Current Low	Current High	1948 Low	1948 High	1947 Low	1947 High
Kauri, N. Y.							
Superior Pale XXX	lb.	no prices		no prices		....	nom.
bgs	lb.	....	.32¾	....	.32¾	....	.31
Sandarac, cks	lb.	.95	1.50	.95	1.50	.85	1.00
Tragacanth, No. 1, cases	lb.	3.60	8.70	3.60	8.70	3.60	8.70
No. 3	lb.	2.00	2.50	2.00	2.50	2.00	3.45
Tacca, bgs	lb.	.06	.07	.06	.07	.06	.07
Hydrogen Peroxide, cbys	lb.	.15½	.18½	.15½	.18½	.15½	.18½
Iodine, Resublimed, jars	lb.	2.35	2.65	2.35	2.65	....	2.65
Lead Acetate, cryst, bbls	lb.	....	.25½	....	.25½	....	.19¼
Arsenate basic, bg, lcl	lb.	.22¾	.23¾	.22¾	.23¾	....	.23¾
Nitrate, bbls	lb.	.17¾	.21½	.17¾	.21½	....	.18
Red, dry, 95% PB_3O_4 bbls	lb.	....	.22¼	....	.22¼	.14¼	.19¼
97% Pb_3O_4 bbls, delv	lb.	....	.22¼	....	.22¼	.15	.19½
98% Pb_3O_4, bbls, delv	lb.	....	.22¾	....	.22¾	.15¼	.19¾
White, bbls	lb.	.16	.16¼	.16	.16¼	.13	.17¾
Basic sulfate, bbls, lcl	lb.	.15¼	.15½	.15¼	.15½	.12½	.15½
Lime, Chem., wks, bulk	ton	6.50	10.25	6.50	10.25	6.50	10.25
Hydrated, f.o.b. wks	ton	8.00	12.14	8.00	12.14	8.00	12.14
Litharge, coml, delv, bbls	lb.	....	.21¼	....	.21¼	.13	.17½
Lithopone, ordi., bgs	lb.	.05½	.06⅜	.05½	.06⅜	.03	.06
Magnesium Carb, tech, wks	lb.	.07¼	.10¾	.07¼	.10¾	.07¼	.10¾
Chloride flake, bbls, wks c-l	ton	....	40.00	....	40.00	....	37.00
Manganese Chloride, Anhyd. bbls	lb.	.12¾	.19	.12¾	.19	.14	.16
Dioxide, Caucasian bgs, lcl	ton	74.75	79.75	74.75	79.75	74.75	79.75
Mannitol, com'l., wks. bbls	lb.	.38	.43	....	....	....	....
Methanol, pure, nat, dms *l*	gal.	.63	1.10	.63	1.10	.63	.73½
Synth, drs cl *m*	gal.	.34½	.41½	.34½	.41½	.31	.41
Methyl Acetate, tech tks	lb.	.06	.09	.06	.09	.06	.07½
C. P. 97-99%, tks, delv	lb.	.09½	.12	.09½	.12	.09½	.10
Chloride Indust., cycl, wks	lb.	.16	.41	.16	.41	.32	.41
Ethyl Ketone, tks, frt all'd	lb.	....	.12½	....	.12½	....	.09
Naphtha, Solvent, tks	gal.	....	.30	....	.30	....	.28
Naphthalene, crude, 74°, wks tks	lb.	.04½	.07	.04½	.07	.035	.083
Nickel Salt, bbls, NY	lb.	.14	.14½	.14	.14½	.14	.14½
Nitre Cake, blk	ton	no stocks		20.00	24.00	....	24.00
Nitrobenzene, drs, wks	lb.	.08½	.10	.08½	.10	.08	.09½
Orthoanisidine, bbls	lb.	....	.80	....	.80	....	.70
Orthochlorophenol, drs	lb.	....	.37	....	.37	.25	.37½
Orthodichlorobenzene, drs	lb.	.07½	.10½	.07½	.10½	.07	.10
Orthonoitrochlorobenzene, wks	lb.	.15	.18	.15	.18	.15	.18
Orthonitrotoluene, wks, drs	lb.	.08	.11	.08	.11	.08	.09½
Paraldehyde, 98%, wks lcl	lb.	.12½	.13½	.12½	.13½	.22	.13
Chlorophenol, drs	lb.	.25	.29	.25	.29	.24	.29
Dichlorobenzene, wks	lb.	.12½	.14	.12½	.14	.12½	.14
Formaldehyde, drs, wks	lb.	.21	.25	.21	.25	....	.22
Nitroaniline, wks, kgs	lb.	.41	.43	.41	.43	.41	.43
Nitrochlorobenzene, wks	lb.	....	.18	....	.18	....	.18
Toluenesulfonamide, bbls	lb.	....	.70	....	.70	....	.70
Toluidine, bbls, wks	lb.	.44	.58	.44	.58	....	.53
Penicillin, ampules per 100,000 units, bulk		.12½	.19	.12½	.19	.14	.38
Pentaerythritol, tech	lb.	.32	.36	.32	.36	.27	.36
PETROLEUM SOLVENTS AND DILUENTS							
Lacquer diluents, tks, East Coast	gal.	.13	.16	.13	.16	....	.14
Naptha East, tks, wks	gal.	.11	.14	.11	.14	....	.11
Rubber solvents, East, tks, wks	gal.	....	.15	....	.15	....	.12
Stoddard Solvents, East, tks, wks	gal.	.11½	.14	.11½	.14	....	.12
Phenol, U.S.P., drs	lb.	.11¼	.13¼	.11¼	.13¼	.11¼	.13¼
Phthalic Anhydride, cl and lcl wks	lb.	.14½	.22½	.14½	.22½	.14½	.17½
Potash, Caustics, 88-92%, wks, sol	lb.	.05¾	.09	.06¾	.09	.06¼	.07½
Flake, 88-92%	lb.	.07½	.09½	.07½	.09½	.07	.08¼
liquid, 45% basis, tks	lb.	....	.03½	....	.03½	....	.03½
ds, wks	lb.	.0337½	.0375	.0337½	.0375	.03¼	.04
Carbonate hydrated 83-85%, bbls	lb.	.05¾	.06	.05¾	.06	.06	.05¾
Chlorate crys, kgs, wks	lb.	.08½	.09¾	.08½	.09¾	.08½	.13
Chloride, USP, cryst, bbls	lb.	.21	.27	.21	.27	.21	.22
Cyanide, drs, wks	lb.	....	.55	....	.55	....	.55
Iodide, drs	lb.	1.95	1.98	1.95	1.98	1.44	1.98
Muriate dom, 60-62-63% K_2O bulk unit-ton		.37½	.53½	.37½	.53½	.37½	.53½
Permanganate, USP, wks drs	lb.	.22½	.24	.22½	.24	.20½	.23
Sulfate, 90%, basis, bgs	ton	36.25	39.25	36.25	39.35	36.25	39.25
Propane, group 3, tks	gal.	.03½	.06¾	.03½	.06¾	.03½	.06¾
Pyridine, reg., drs	lb.	.60	.69	.60	.69	.55	.65
R Salt, 250 lb bbls, wks	lb.	.61	.72	.61	.72	....	.72
Resorcinol, tech. drs, wks	lb.	....	.68	....	.68	.64	.74
Rochelle Salt, cryst	lb.	.31½	.35	.31½	.35	.32½	.35
Salt Cake, dom, blk wks	ton	20.00	28.00	20.00	28.00	....	26.00
Saltpeter, grn, bbls	100 lbs.	8.75	10.25	8.00	10.25	8.20	9.50

l Producers of natural methanol divided into two groups and prices vary for these two divisions; *m* Country is divided into 4 zones, prices varying by zone. Spot price is ½c higher.

Current Prices

Shellac Oils & Fats

	Current Low	Current High	1948 Low	1948 High	1947 Low	1947 High
Shellac, blchd, bone dry, bbls.....lb.	.58½	.77	.58½	.77	.58½	.74½
Silver Nitrate, bots, 2,500-oz. lots.....oz.	.42¼	.48	.42¼	.48	.42¼	.59
Soda Ash, 58% dense, bgs, c-l, wks.....100 lbs.	....	1.50	....	1.50	....	1.38
58% light, bgs cl..100 lbs.	....	1.40	....	1.40	....	1.30
Caustic, 76% flake drs, cl.....100 lbs.	....	3.45	....	3.45	2.90	3.25
76% solids, drs, cl..100 lbs.	....	3.05	....	3.05	2.50	2.85
Liquid, 47-49%, sellers, tks.....100 lbs.	....	2.10	....	2.10	....	2.10
Sodium Acetate, anhyd. drs.....lb.	.06½	.11	.06½	.11	.06½	.11
Benzoate, USP drs.....lb.	.46	.52	.46	.52	.46	.52
Bicarb, USP, gran., bgs, cl., works.....100 lbs.	....	2.35	....	2.35	2.25	2.59
Bichromate, bgs, wks l.c.l.....lb.	.08¾	.09¾	.08¾	.09¾	.07⅞	.09¾
Bisulfate powd, bbls, wks.....100 lbs.	3.00	3.60	3.00	3.60	3.00	3.60
35° bbls, wks.....100 lbs.	1.10	1.65	1.10	1.65	1.40	1.65
Chlorate, kgs, wks cl.....lb.	....	.07¼	....	.07¼	....	.06¾
Cyanide, 96-98%, drs....lb.	.14½	.15½	.14½	.15	.14½	.15½
Fluoride, 95%, bbls, drs..lb.	.09¾	.10	.09¾	.10	.07¼	.10
Hyposulfite, cryst. bgs, cl. wks.....100 lbs.	....	3.00	....	3.00	....	2.75
Metasilicate, gran., bbl, wks c-l.....100 lbs.	3.25	3.40	3.25	3.40	....	3.40
Nitrate, imp, bgs, c.l....ton	....	51.50	....	51.50	....	42.50
Nitrite, 96-98% bbl, cl...lb.	....	.06¾	....	.06¾	....	.06¾
Phosphate, dianhyd, bgs, wks.....100 lbs.	6.25	7.80	6.25	7.80	6.00	7.00
Tri-bgs, cryst, wks.....100 lbs.	3.40	3.90	3.40	3.90	2.70	3.90
Prussiate, yel. bbls, wks..lb.	.12	.12¼	.12	.12¼	....	.12¼
Silicate, 52°, drs, wks.100 lbs.	1.55	2.00	1.55	2.00	1.40	2.00
40°, drs, wks, c-l...100 lbs.	.95	1.15	.95	1.15	....	1.15
Silicofluoride, bbls, NY..lb.	.05	.08½	.05	.08½	.06¼	.08½
Sulfate tech, Anhyd, bgs.....100 lbs.	2.10	2.60	2.10	2.60	1.70	2.60
Sulfide, cryst c-l, bbls, wks.....100 lbs.	....	3.75	....	3.75	....	3.00
Solid bbls, wks.....lb.	3.50	5.50	3.50	5.50	3.05	5.50
Sorbitol, c.l., wks.....lb.	.25½	....	....	....	....	....
Starch, Corn, Pearl bgs.....100 lbs.	6.37	7.17	6.37	7.17	4.99	7.17
Potato, bgs, cl.....lb.	.08	.1180	.08	.1180	.0875	.1075
Rice, bgs.....lb.	no stocks		no stocks		no stocks	
Sweet Potato, bgs.....lb.	no stocks		no stocks		no stocks	
Sulfur, crude, mines.....ton	16.00	18.00	16.00	18.00	16.00	18.00
Flour, USP, precp, bbls, kgs.....lb.	.18	.30	.18	30	.18	.36
Roll, bbls.....100 lbs.	2.45	3.40	2.45	3.40	2.65	3.40
Sulfur Dioxide, liquid, cyl..lb.	....	.09	....	.09	.07	095
tks, wks.....lb.	.04½	.05	.04½	.05	....	.044
Talc, crude, c-l, NY.....ton	....	15.00	....	15.00	....	15.50
Ref'd c-l, NY.....ton	14.50	24.50	14.50	24.50	14.50	24.50
Tin, crystals, bbls, wks.....lb.	.55	.71½	.55	.71½	....	.60
Metal.....lb.	....	1.03	....	1.03	....	.80
Toluol drs, wks,.....gal.	.28	.37	.28	.37	.28	.29½
tks, frt all'd.....gal.	....	.23	....	.23	....	.23
Tributyl Phosphates, drs, lcl, frt all'd.....lb.	.66	.72	.66	.72	....	.72
Trichloroethylene, drs, wks..lb.	.09¼	.10½	.09¼	.10½	.08	.10½
Tricresyl phosphate tks.....lb.	.32¼	.45	.32¼	.45	.32¼	.33
Triethylene glycol, drs.....lb.	.18½	.20½	.18½	.20½	.18½	.19½
Triphenyl Phos., bbls.....lb.	.26	.31	.26	.31	.26	.32
Wax, Bayberry, bgs .....lb.	.52	.55	.52	.55	no stocks	
Bees, bleached, U.S.P. cakes.....lb.	.65	.73	.65	.73	.68	.73
Candelilla, bgs, crude....lb.	.61	.65	.61	.65	.62	.80
Carnauba No. 1, Yellow, bgs, ton.....lb.	1.20	1.55	1.20	1.55	1.30	2.00
Xylol, Indus., frt all'd, tks wks.....gal.	.28	.30	.23	.30	....	.23
Zinc Chloride tech, fused, wks.....lb.	.0625	.0655	.0625	.0655	.05	.0655
Oxide, Amer., bgs, wks.. lb.	....	.11	.08½	.11	.09	.10
Sulfate, crys, bgs....100 lbs.	4.15	4.90	4.15	4.90	3.40	4.90
OILS AND FATS						
Babassu, tks.....lb.	.14½	.28½	.14½	.28½	.14½	.27½
Castor, No. 3, drs, c.l.....lb.	.20½	.34¼	.26½	.34¼	.27¾	.34¾
China Wood, drs, spot NY. lb.	.21½	.27	.21½	.27	.24	.41
Coconut, edible, drs Atlantic ports.....lb.	.18	.27	.18	.27	.18	.37
Corn, crude, tks, wks.....lb.	....	.32	....	.32	....	.31
Linseed, Raw, drs, c.l.....lb.	.2900	.3430	.2900	3430	.3160	.3960
Menhaden, crude tks.....	.15	.22	.15	.22	.19	.22
Light, pressed, drs l.c.l...lb.	.16	.26	.16	.26	.16	.29
Palm, Niger, dms.....lb.	no prices		no prices		no prices	
Peanut, crude, tks, f.o.b. wks.....lb.	.17	.30	.17	.30	.20	.37
Perilla, crude, dms, NY....lb.	no stocks		no stocks		no stocks	
Rapeseed, bulks.....lb.	no prices		no prices		no prices	
Red, dms.....lb.	.17¾	.33¾	.17¾	.33¾	.17¾	.33¾
Soy Bean, crude, tks, wks...lb.	.15½	.29¾	.15½	.29¾	.15¼	.33
Tallow, acidless, dms.....lb.	.19½	.35	.19½	.35	.19½	.35

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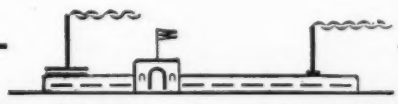
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1—Houchin 30″ Automatic CUTTING TABLE.

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Personnel Notes

• PURE CARBONIC, INC. has named N. L. Heffron assistant district manager of the Metropolitan District.

• William E. Anklam has been named director of new products commercial research for GENERAL MILLS, INC., Minneapolis. He succeeds A. E. Burnett, who was killed in an automobile accident near Proctor, Minn., July 4.

• David E. Pearsall has been made administrative director and manager of research of BICKFORD RESEARCH LABORATORIES INC., Avon, Conn. which was recently formed from the merger of Bickford Research Laboratories and Technical Development Institute. John D. Rich is manager of development.

• Stanley R. Wilson has been appointed secretary of UNIVERSAL OIL PRODUCTS Co. He was graduated from the University of Illinois in 1922 with a Bachelor of Science degree in industrial and mechanical engineering, and joined Universal the same year.

• A. H. Hayes has been promoted to assistant general superintendent of the Whiting, Ind., refinery of STANDARD OIL Co. (Indiana) to succeed J. C. Ducommum, who became refinery manager July 12.

Mr. Hayes joined the company in 1930 as a chemist in the Whiting research laboratory. After serving also in the pressure-still and crude-still departments at the Whiting refinery, he became superintendent of the light oils division at the refinery in 1946.

• Howard Kapner has been placed in charge of the new Glass Section of the laboratories of Sam Tour & Co., Inc. He will handle all testing, laboratory and research work on glass.

• Alexis G. Pincus will head the Ceramics Department of Horizons, Inc. Since 1932, Dr. Pincus has been associated with the American Optical Co. in its research department.

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U. S. Patents from Official Gazette — Vol. 609, Nos. 3, 4; Vol. 610, Nos. 1, 2 (April 20 - May 11)
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Coatings

Coating composition which comprises a vinyl halide resin and a solvent and having incorporated therewith a hydroxy polycarboxylic acid to resist blackening of the coating when the composition is baked on a surface. No. 2,439,677. Carl L. Shapiro (to Lynnwood Laboratories, Inc.).

Cellulose ester melt-coating composition. No. 2,439,103. Martin Salo, Harold F. Vivian (to Eastman Kodak Co.).

Flexible sheet material comprising a surface coating containing polyvinyl chlorides. No. 2,439,051. John Heron McGill (to Imperial Chemical Industries, Ltd.).

Composition for and method of coating aluminum. No. 2,438,877. Frank Palin Spruance, Jr. (to American Chemical Paint Company).

Canadian

Protecting metallic objects and in particular magnesium and its alloys, which comprises the formation on the said metal object of a protective coating produced in the absence of any external source of electric current in a solution containing an ion of which at least part is constituted by manganese. No. 448,925. Jean Frasch.

An emulsion comprising an aqueous phase, a phase consisting essentially of a volatile water-immiscible organic liquid having dissolved therein an agent capable of producing a stable emulsion of water and said liquid, and a dispersed phase of pigmented resin-solvent aggregate. No. 448,721. Norman S. Cassel (to Interchemical Corp.).

A lacquer consisting of ethylene glocol mono-methyl ether acetate and cellulose acetate, ethylene glycol mono-methyl ether acetate and an approximately 5 per cent solution of selenium dioxide in ethyl alcohol. No. 448,712. Otto Saslaw (to Federal Telephone and Radio Corporation).

A coating composition of effective adhesion to smooth surfaces, containing a conjoint polymer of a vinyl halide, a vinyl ester of a lower saturated fatty acid, and an aliphatic alpha, beta-mono-olefinic carboxylic acid. No. 448,698. William E. Campbell, Jr. (to Carbide and Carbon Chemicals Limited).

A new article comprising a base of stainless steel containing chromium in substantial quantity, a uniform, dark colored adherent film comprising oxides of chromium and iron and a plating of copper overlying said oxide film. No. 448,565. Clements Batcheller (to The Coloron Corp.).

Dyes Pigments

Process of printing nylon fabric by the aid of a printing paste containing as special assistants caprolactam and an ammonium salt selected from the group consisting of the neutral and acid ammonium salts of sulfuric, phosphoric and pyrophosphoric acids. No. 2,439,745. Charles Franklin Miller (to E. I. du Pont de Nemours & Company).

Anthraquinone vat dyestuffs. No. 2,439,626. Walter Kern (to Society of Chemical Industry).

Azo dyes from dihydrozy benzidine. No. 2,439,153. Fritz Straub, Jakob Brassel and Peter Pieth (to Society of Chemical Industry in Basle).

Cyanine dyestuffs. No. 2,438,782. John David Kendall (to Ilford Limited).

Manufacture of copper-containing disazo dyestuffs of general formula described in patent. No. 2,438,754. Adolf Krebser and Werner Bossard (to J. R. Geigy A. G.).

Production of dyestuff intermediates comprises condensing salt taken from group consisting of alkyl and aralkyl p-toluene sulphonate quaternary salts of heterocyclic nitrogen compound of type used in cyanine dyes, etc. No. 2,438,705. John David Kendall (to Ilford Limited)

Organic compounds serving as cyanine dyestuff intermediates. No. 2,438,704. John David Kendall, Henry Walter Wood and John Raymond Majer (to Ilford Limited).

Sulfur dye made by heating symmetrical compound represented by formula described in patent. No. 22,983. Norman Hulton Haddock (to Imperial Chemical Industries Limited).

Equipment

Electrically indicating liquid filled manometer. No. 2,439,770. Harold A. Brown and Harry Gollob.

Self-sealing pipe coupling. No. 2,439,760. Percival Edward Thomas (to Sterling Industries Limited).

Float-operated switch. No. 2,439,753. Charles N. Reavis (to Silas B. Coley).

Mechanism for moving a valve under control of a fluid-filled device which is responsive to temperature changes. No. 2,439,706. Charles A. West.

Indicating device for cylindrical gas containers. No. 2,439,696. Alvin H. Schaal.

Pump or compressor. No. 2,439,668. Arthur Alexander Mercer (to Bernard Mason).

In a flow-ratio meter the combination comprising a first rotameter tube, a second rotameter tube extending longitudinally within said first rotameter tube. No. 2,439,614. Milton Ernest Schramm (to Shell Development Company).

A vertical cylindrical conversion chamber in apparatus suitable for effecting catalytic conversion of hydrocarbons with solid catalyst of small particle size. No. 2,439,582. Fred W. Scheineman (to Standard Oil Company).

Centrifugal pump. No. 2,439,577. Orio Clair Norton.

Fluid pump. No. 2,439,448. Cecil C. Buckner.

Pressure measuring apparatus. No. 2,439,342. William J. Hudson.

Viscosimeter. No. 2,439,287. Louis C. Eitzen.

Apparatus for heating sensitive materials. No. 2,439,260. Reginald E. Meade and John E. Crews (to Western Condensing Co.).

Vacuum pump. No. 2,439,258. Marcel Matricon (to General Electric Co.).

Fluidtight connection between a bolted pipe fitting and a fluid storage tank. No. 2,439,244. Joseph C. De Weese (The Glenn L. Martin Co.).

Relief and by-pass pump valve assembly. No. 2,439,242. Russel R. Curtis (to Curtis Pump Co.).

Pump assembly. No. 2,439,241. Russell R. Curtis and Richard L. Gates (to Curtis Pump Co.).

Three-fluid heat exchanger. No. 2,439,208. Walter Gloyer (to American Locomotive Co.).

Cut-off device for automatically closing a fluid line. No. 2,439,117. William Waterman.

Cut-off device for automatically closing a fluid line. No. 2,439,116. William Waterman.

Valve controlling mechanism. No. 2,439,113. George B. Thieme (to Bendix Aviation Corp.).

Valve. No. 2,439,110. George N. Strike.

Indicating pressure at a distance. No. 2,439,092. Floyd T. Linstrom (to Gerald B. Waldron, Charles H. Callison).

Pressure and flow regulator for low pressure gaseous fluids. No. 2,438,973. Clarence Johnson (to Bailey Meter Co.).

Temperature control in fluidized catalyst systems. No. 2,438,728. Charles W. Tyson (to Standard Oil Development Company).

Method of detecting presence of gas in atmosphere. Includes steps of exposing plates of each of two similar electrical capacitances to atmosphere, etc. No. 2,438,550. William F. Ertzman (to The Brown Instrument Company).

Apparatus for treatment of traveling materials with fluid media. No. 2,438,549. William J. Elvin and Max A. Shaffer and Elmer R. Stahl (to Celanese Corporation).

Waste liquor aerator. No. 2,438,342. Edward B. Mallory.

Apparatus for effecting proportional addition of one liquid to another. No. 2,438,327. William Smalley (to The Paterson Engineering Company Limited).

Pulp ejector. No. 2,438,258. Rupert Octavius Stokes.

Separation of emulsions of liquids having different specific gravities, the process comprises introducing emulsion comprising nitrated liquid explosive in its nitrification medium into cylindrical separating zone having vertical axis, etc. No. 2,438,244. Mario Biazzi.

Catalytic reactor comprising in combination shell relatively shallow catalyst bed within shell, inlet conduit projecting into shell on one side of bed for supplying fluid reactant to bed, etc. No. 2,438,242. Charles C. Watson (to Universal Oil Products Company).

Canadian

Axial flow compressor. No. 449,145. William Rede Hawthorne (to Power Jets (Research & Development) Ltd.).

Compressor and turbine. No. 449,144. Alun Raymond Howell (to Power Jets (Research & Development) Ltd.).

Centrifugal fan. No. 449,137. Jan Christiaan Busquet (to Machinefabriek Gebr. Stork & Co.).

A liquid supply pipe having a spray nozzle at its discharge end constructed to discharge a flat spray. No. 449,111. Richard S. Leigh (to The Babcock & Wilcox Company).

Filter adapted to be operated under high pressure. No. 449,106. William F. Caldwell (to American Cyanamid Company).

Temperature control by stream of boiling water at a different predetermined through substantially the entire extent of the jackets of said converters, preventing the pressures within the respective converters from rising above predetermined pressures. No. 449,103. Norman William Wroby (to The Barret Co.).

Contacting solids with gaseous fluid. No. 449,048. Henry J. Ogorzly, Homer Z. Martin and Joseph V. Marancik (to

Standard Oil Development Co.).

Conduit for handling corrosive fluids under pressure comprising a rigid corrosion-resistant micro-porous lining in a pressure-resisting casting separated therefrom by a thin film of a corrosion-resistant metallic material. No. 449,047. Robert E. Chappell, Clayton M. Beamer and Ralph B. Duff (to Standard Oil Development Co.).

Pump, compressor, motor or the like. No. 449,029. Frederick Walter McCombie (to Megator Pumps & Compressors Limited).

Speed regulating mechanism for a motor driven compressor. No. 449,023. Wade Hampton Wineman (to Sullivan Machinery Company, and Joy Manufacturing Company).

Apparatus for dissolving finely divided chemicals, comprising a container with a supply pipe for chemicals, a collecting tank for dissolving liquid, a circulation conduit for dissolving liquid, a pump in said circulation conduit, a branch conduit extending from the pressure side of the circulation conduit, a discharge pipe, and a controllable valve. No. 448,968. Nils Enok Nilsson and Georg Evald Alexander Dahlquist (to Aktiebolaget Svenska).

Drying kiln. No. 448,959. Albert J. Ruckman.

A pressure safety device comprising an annular casing closed by a circular cross-sectional member fitting into upper portion of said casing and held in position due to upward pressure by a calibrated shear resisting element, with a thin impervious membrane sealing the joint. No. 448,901. Lyle M. Cooper (to Standard Oil Development Co.)

Valve comprising a mushroom shaped head, a stem and means loosely embracing the stem of the valve over a small portion of the length, limited axially movable relative to the stem and having a plurality of identical equally spaced bearing areas upon the valve stem at both limits of its relative movement with the valve stem. No. 448,868. Joseph Henry Hoern (to Eaton Manufacturing Company)

Tube for a heat exchanger comprising a metal tube having a helical fin spirally wound and secured on the outer surface of the tube, said fin being formed of wire of substantially triangular or wedge-shape cross section. No. 448,866. Edward Samuel Lea (to Doyle & Roth Company)

High pressure radial piston pump for liquids. No. 448,827. Georges Pauget.

Flexible tube pump. No. 448,795. Lyndus E. Harper.

In a secondary surface heat exchange apparatus of annular or segmental form at least two sets of concentric arcuate tubes for separate cooling fluids combined in alternate spaced relation the tubes of one set being all of equal length. No. 448,793. James Frank Belaieff (to Cyril Terence Delaney and Gallay Limited).

A centrifugal fan or centrifugal pump for two directions of rotation and provided with a guide apparatus. No. 448,740. Johannes Overweg (to Machinefabriek Gebr. Stork & Co.)

An automatic siphon apparatus adapted to receive a continuous flow of liquid and to deliver it by gravitation in successive siphon discharges. No. 448,720. Frank Douglass Miles (to Imperial Chemical Industries Limited)

Insulated pipe. No. 448,636. Albert Allen Durant.

Pipe coupling or joint. No. 448,630. Michael M. Mars and Albert Mars.

Multiple contact counter-current extractor. No. 448,532. Carl E. Mensing (to American Cyanamid Co.)

A contrivance for screening desiccating or washing of suspensions of solids, said screen being formed as a hollow rotation body with a vertical axis and being arranged to be rotate. No. 448,518. Nils Walfrid Jonsson.

Explosives

Treating cyclonite by poaching the same in an aqueous bath containing acetone and a nitroparaffin. No. 2,439,648. Jerome G. Burtle and Wilfred H. Brandt (to Olin Industries, Inc.)

Plastic detonating explosives which comprise a self-explosive solid compound from the group of self-explosive non-aromatic crystalline solid nitric esters and cyclo-trimethylenetrinitramine distributed through a continuous matrix. No. 2,439,328. Harold Reginald Wright and William Gordon Allan (to Imperial Chemical Industries Ltd.)

Propellant powder comprising nitrocellulose having incorporated therein a minor amount of a neutral ester of a glycol taken from the class consisting of ethylene and propylene glycols with an acid taken from the class consisting of caprylic, capric and lauric acids. No. 2,439,281. George Barsky (to E. F. Drew & Co., Inc.)

Canadian

Method of producing crystalline trinitrotoluene. No. 448,674. Max Charles Knake (to Canadian Industries Limited)

Producing tetryl by passing a mixed acid into a nitration apparatus and introducing a solution of dimethylaniline in sulphuric acid. No. 448,574. George Washington Batchelder (to E. I. du Pont de Nemours and Co.)

Food

Manufacture of lactose from a liquid lacteal material containing milk protein and lactose. No. 2,439,612. David D. Peebles and Thomas V. Marquis (to Western Condensing Company).

Method of producing corn syrup solids. No. 2,439,384. Walter R. Fetzer (to Union Starch & Refining Co.).

Modifying sweet potato starch for use as gelling agent. No. 2,438,855. Ralph W. Kerr and Norbert F. Schink (to Corn Products Refining Company).

Extraction of fat soluble vitamins from material selected from fish liver oils and fish livers serving as the vitamin containing material by method which includes alkali saponification of fats in material and separating vitamins from resulting mixture. No. 2,438,554. Louis Freedman.

Canadian

Making a synthetic thyroprotein by substituting iodine in a protein containing tyrosine. No. 449,171. Charles W. Turner and Ezra P. Reineke (to American Dairies, Inc., and Quaker Oats Co.).

Production of starch conversion syrup by acid hydrolysis of starch in aqueous suspension at superatmospheric steam pressure in contact with activated carbon of vegetable origin. No. 448,702. Richard Nicholas Monte (to Corn Products Refining Company).

Inorganic

Method of activating an oxide gel comprising passing the gel in the form of granules downwardly in a then, substantially vertical stream and passing a drying gas at an elevated temperature transversely through a lower portion of said stream. No. 2,439,741. Frederick Lucas Litty, Jr. (to The Davison Chemical Corporation).

Producing aluminum bromide by contacting metallic aluminum with a material selected from the group consisting of bromine and hydrogen bromide. No. 2,439,737. Victor E. Houston and Alex G. Oblad (to Socony-Vacuum Oil Company).

Preparing stable sodium tetrathionate powder which comprises treating sodium tetrathionate dihydrate crystals with a liquid consisting of an anhydrous organic solvent in which water is readily soluble. No. 2,439,720. Raymond W. Crosley and Albert L. Raymond (to G. D. Searle & Co.).

Ammoniation of fertilizers. No. 2,439,432. Frank G. Keenen and Ralph L. Dodge (to E. I. du Pont de Nemours & Co.).

Process for obtaining hydroxides of metals of the group consisting of alkali metals and alkaline earth metals from the sulfides of the corresponding alkali metals and of the alkaline earth metals by reacting the selected sulfide with the aqueous ammonium complex of a metal hydroxide. No. 2,439,404. Dan B. Wicker (to American Viscose Corp.).

Preparation of colloidal sulphur which comprises the decomposition of ammonium polysulphide by an aldehyde in the presence of a protective colloid selected from the group consisting of ammonium caseinate plus ammonium ricinoleate and ammonium alginate plus ammonium oleate. No. 2,439,147. Fernand Frederic Schwartz.

Stabilized aqueous hypochlorite solution, containing soluble hypochlorite and as stabilizing agent minor amount of compound of general formula described in patent. No. 2,438,781. Jonas Kamlet (to Boyle-Midway Inc.).

Higher alkoxy-silicon halides. No. 2,438,736. Arthur J. Barry (to The Dow Chemical Company).

Preparation of nonsintered iron catalyst for hydrogenation of carbon monoxide from iron compound capable of conversion at least in part to iron oxides. No. 2,438,584. Meredith M. Stewart (to The Texas Company).

Preparation of alumina-group VI oxide catalyst. No. 2,438,569. William J. Mattox (to Universal Oil Products Company).

Producing finely divided catalyst comprises commingling mineral acid with solution containing not more than 30% by weight of alkali metal silicate, 7 to 15% of alkali metal halide, 51 to 91% of water, compositing silica with metal oxide. No. 2,438,560. Elmer R. Kanhofer (to Universal Oil Products Company).

Copper, chromium, arsenic compound for wood preserving. No. 2,438,511. William McMahon (to Bell Telephone Laboratories, Incorporated).

Making portland cement low in alumina content and recovering commercially pure alumina from raw materials, one of which is predominantly aluminous silicious material and other of which is predominantly calcium carbonate. No. 2,438,488. Frank J. Anderson and Duncan R. Williams (to Monolith Portland Midwest Company).

Activating bentonite clays comprises treating clays with inorganic acid of group consisting of sulfuric acid and hydrochloric acid. No. 2,438,451. John J. Owen (Standard Oil Development Company).

Continuous process for drying microspherical inorganic oxide gel particles. No. 2,438,450. Karl J. Nelson (to Standard Oil Development Co.).

Production of gel type catalysts comprises displacing water in hydrous inorganic oxide gel with non-aqueous organic liquid partially miscible with water and having boiling point below 200° C., heating gel with liquid under pressure of 100 p. s. i. to temperature between normal boiling point and critical temperature of liquid exploding gel by sudden release of pressure. No. 2,438,379. Raymond C. Archibald and Bernard S. Greensfelder and Frank T. Eggertsen (to Shell Development Company).

Separating aqueous hydrogen peroxide solution from nonvolatile impurities. No. 2,438,252. Chester Northup Richardson (to The Mathieson Alkali Works, Inc.).

Producing colloidal aqueous sol of hydrous oxide consists in passing aqueous solution of salt of element capable of forming such oxide through mass of alkali-regenerated anion-exchange material. No. 2,438,230. John W. Ryznar (to National Aluminate Corporation).

Canadian

Preparing cyanamide by precipitating calcium with a gaseous precipitant while the reactants are subject to a turbulent centrifugal treatment. No. 449,107. Courtland M. Hulings (to American Cyanamid Company).

Producing cyanamide from calcium cyanamide. No. 449,105. George H. Foster (to American Cyanamid Company).

Obtaining polyphosphate by fusing an alkali metal phosphate with P_2O_5. No. 448,973. Charles F. Bonnet and Robert B. Booth (to American Cyanamid Co.).

Process of producing white liquor from crude soda lye in which crude soda lye is treated with quick lime, the improvement which comprises subjecting the mixture to the action of centrifugal force and separating as constituents of different specific gravities, the white liquor from lime sludge. No. 448,967. John Axel Aspegren (to Aktiebolaget Separator).

Manufacturing superphosphate. No. 448,864. Mark Shoeld (to The Davison Chemical Corporation).

Removing from the surface of metals resistant to fused caustic alkalies dense firmly adherent oxide that has formed thereon through exposure to air under oxidizing conditions which comprises subjecting the oxide to the action of a fused substantially anhydrous bath, comprising caustic alkali containing an oxidizing agent. No. 448,717. Harry R. Spence and Horace W. Hooker, Jr. (to Hooker Electrochemical Co.).

Production of briquettes from magnesia by incorporating moisture in the material. No. 448,704. John Parsons Dick (to Dominion Magnesium Limited).

Manufacture of sulphamic acid by reaction between urea and sulphuric acid and liquid sulphur trioxide in the presence of excessive amounts of said liquid sulphur trioxide. No. 448,695. Ernest John Tauch (to Canadian Industries Limited).

Process which comprises incorporating a water soluble silver salt in an aqueous-alkanol solution of 1 to 3 carbon atoms containing a water-sensitive polyamide. No. 448,692. William Way Watkins (to Canadian Industries Limited).

A saturated macromolecular organic compound having at least one recurring unit linked in chain-like fashion containing sulphur, and wherein two bivalent sulphur atoms are attached by a bivalent bridging radical. No. 448,689. Emmette Farr Izard (to Canadian Industries Limited).

Manufacture of sulphamic acid by mixing urea and sulphamic acid to form a paste and introducing sulphuric acid and sulphur triovide. No. 448,686. Howard Raymond Wilson (to Canadian Industries Limited).

Condensation products of sodium cyanamide and formaldehyde. No. 448,681. Joseph Frederick Walker (to Canadian Industries Limited).

A process for the manufacture of sulphamic acid from urea, sulphuric acid and sulphur trioxide. No. 448,680. Ernest John Tauch (to Canadian Industries Limited).

Process for separating hydrogen fluoride from silicon fluoride with a substantially anhydrous absorbing liquor consisting essentially of ffuosulphonic acid. No. 448,662. Abner C. Hopkins, Jr., Richard M. Stephenson and William E. Watson (to General Chemical Company).

That improvement in aqueous pyrophosphate copper plating baths which comprises nitrate radicals as a constituent of the bath. No. 448,612. Jesse E. Stareck (to United Chromium Inc.).

Producing a material containing compounds of alkali metal, phosphorous and aluminum. No. 448,531. David Lurie (to American Cyanamid & Chemical Corporation).

Medicinal

Aqueous solution containing riboflavin in concentration higher than 0.013%, gentisic acid, and water-soluble salt of gentisic acid and member of group consisting of alkali metals, ammonia, and organic bases, solution at pH less than 5. No. 2,438,880. Max Frank Furter and Max Hoffer (to Hoffman-La Roche Inc.).

Producing nitro estrone comprises subjecting estrone dissolved in inert solvent, at elevated temperature, to action of concentrated nitric acid. No. 2,438,819. Joseph B. Niederl.

Isolating cholic acid from bile. No. 2,438,232. Robert H. Sifferd (to Armour and Company).

Reaction product of graminicidin and formaldehyde and method of production. No. 2,438,209. Heinz L. Fraenkel-Conrat, Harry Humfeld, and James C. Lewis and Harold S. Olcott (to United States of America).

Therapeutic composition for oral administration producing higher blood-levels of penicillin than upon oral administration of penicillin alone comprising penicillin and sodium citrate to protect penicillin against destruction by gastric hydrochloric acid. No. 2,438,106. Harvey E. Alburn, Jesse Charney and Finn W. Bernhart (to Wyeth Incorporated).

Canadian

Synthesizing thyroxine from diiodotyrosine. No. 449,172. Charles W. Turner and Ezra P. Reineke (to American Dairies, Inc., and The Quaker Oats Co.).

Process of preparing estrogenic esters of diphenyl propane compounds which comprises reacting a di (hydroxyphenyl) propane with an acylating agent, diluting with water, treating with an alkali. No. 448,894. Ralph Colton Tallman and Alfred Herbert Stuart (to Schieffelin & Co.).

Process for preparing estrogenic diphenyl propane compounds which comprises condensing an alkoxy benzaldehyde with an alkoxy alkanoyl benzene, forming a dialkoxy chalcone, reacting the latter with an alkyl magnesium halide, forming a 1,3-di(alkoxyphenyl) alkanone, reacting the latter with a second alkyl magnesium halide, forming a di(alkoxyphenyl) alkene, hydrogenating the latter to a di(alkoxyphenyl) propane, and deetherifying the last-named compound, forming a di(hydroxyphenyl) propane. No. 448,893. Ralph Colton Tallman and Alfred Herbert Stuart (to Schieffelin & Co.).

Metals, Ores

Removing metallic iron from a fused alumina-cryolite composition by treatment with a reducing agent to reduce iron oxide to iron which settles to the bottom of the confining vessel. No. 2,439,216. David S. McLellan (to Reynolds Metals Co.).

Beneficiating oxidized iron ores by froth flotation which comprises conditioning the ore with an organic acid, having a disassociation constant of at least 10 to the minus 7 selected from the group consisting of water soluble lower aliphatic monobasic carboxylic acids and aromatic sulfonic acids. No. 2,439,200. Robert B. Booth and Earl C. Herkenhoff (to American Cyanamid Co.).

Recovering metals values from cupro-nickel slags. No. 2,438,-911. Anton Martin Gronningsaeter (to Falconbridge Nickel Mines Ltd.).

Making steel having reduced strain-sensitivity, comprises forming basic open hearth heat containing iron oxide and limestone and having 1.25% to 1.80% carbon at melt-down of metallic charge, oxidizing carbon under slag percentage CaO to SiO_2 ratio of which is under 2.3. No. 2,438,798. Henry M. Banta (to Jones & McLaughlin Steel Corporation).

Alloy steel containing 1 to 2% carbon, 0.25 to 1% chromium, 0.75 to 1.5% manganese, 0.25 to 1% molybdenum, 1.5 to 2.5% nickel, 0.75 to 1.25% silicon, remainder iron. No. 2,438,267. Frederick R. Bonte (to The Timken Roller Bearing Co.).

Canadian

Production of magnesium by thermic reduction. No. 448,626. Luigi Amati.

Treatment of iron pyrite ashes and of other natural and artificial complex iron ores containing the group zinc, copper, cobalt, nickel, silver, gold, wherein the iron is non-attackable by chlorine with the purpose of recuperating the said non-ferrous metals the step of chlorinating roasting of the said ore. No. 448,505. Edouard Caude Arbel.

Organic

Separation of thiophenes from hydrocarbons by azeothropic distillation. No. 2,439,777. George R. Lake and Josephine M. Stribley (to Union Oil Company).

Metal acetylide catalyst consisting of a mass of finely divided particles of a catalyst support and a heavy metal acetylide selected from the group consisting of the acetylides of copper, silver, gold, and mercurous mercury. No. 2,439,765. Joseph Frederick Walker and Thomas Edward Londergan to E. I. du Pont de Nemours & Co.).

Process for producing the dihydrate of 2-methoxy-6-chloro-9-(4'-diethylamino-1'-methyl-butylamino)-acridine dihydrochloride which comprises reacting 2-methoxy-6:9-dichloro-acridine with 2-amino-5-diethylamino-pentane in a medium of phenol. No. 2,439,746. Arthur George Murray (to Imperial Chemical Industries Limited).

Pyridine carbonyl amides of the benzene series. No. 2,439,728. Peter F. Gross (to E. I. du Pont de Nemours & Company).

Process of separating weakly acid-reacting compounds from a non-acid water-insoluble organic liquid. No. 2,439,670. Johan C. D. Oosterhout (to The Texas Company).

Process of making butadiene by reacting a mixture of acetaldehyde with ethyl acetate in the vapor state in the presence of steam and a dehydrogenation-dehydration catalyst. No. 2,439,587. Eldon E. Stahly (to Koppers Co., Inc.).

Preparation of adipic acid by the oxidation of cyclohexane. No. 2,439,513. Clement H. Hamblet and Ambrose McAlevy (E. I. du Pont de Nemours & Company).

Fluorinated acrylonitrile derivatives having the formula of $CF_2 = CXCN$ where X is selected from the group consisting of chlorine and fluorine. No. 2,439,505. David W. Chaney (to American Viscose Corporation).

Alkylation of benzene by long chain polymeric olefins using sulfuric acid catalyst. No. 2,439,457. John Joseph Donleavy and Manuel Mannheim Baizer (to Allied Chemical & Dye Corporation).

Synthesis of nitriles by passing an amide of a carboxyalkane having from 2 to 20 carbon atoms per molecule with carbon monoxide in steam, over a water-gas reaction catalyst. No. 2,439,426. William F Gresham (to E. I. du Pont de Nemours & Co.).

Production of disubstituted polyhydric phenols. No. 2,439,421. Edwin R. Erickson (to The Matheison Alkali Works, Inc.).

Production of propionic acid anhydride which comprises subjecting propionic acid in a mixture of propionic acid and benzene to catalytic pyrogenic dehydration. No. 2,439,417. Joseph E. Bludworth, Max O. Robeson and Harry A. Truby, Jr. (to Celanese Corp of America).

Making acetyl peroxide by reacting acetic anhydride and hydrogen peroxide in the presence of an ester or phthalic acid. No. 2,439,399. Edward S. Shanley and Harlow G. Hyatt (to Buffalo Electro-Chemical Co.).

Process of preparing substituted 4-quinazolones which comprises heating an N-acyl-o-amino cyclic carboxylic acid. No. 2,-439,386. Alfred Guenther and Jack F. Morgan (to General Analine & Film Corp.).

Utilizing tall oil to form a siccative oil-resin-tall oil gel. No. 2,439,377. Martin K. Bare and Warren Stubblebine (to Armstrong Cork Co.).

Preparation of meta-substituted phenols by subjecting a 1.2 methylene dioxy benzene to reductive splitting with a Raney type alloy and alkali solution. No. 2,439,375. Erwin Schwenk and Domenick Papa (to Schering Corp).

Producing an N-substituted B-aminopropionitrile which comprises bringing together ethylene cyanohydrin and a compound chosen from the group consisting of a heterocyclic amine which contains a hydrogen atom attached to nitrogen, and an aliphatic amine of the formula R(R')N-H wherein R represents an aliphatic hydrocarbon radical and R' is a member of the group consistin gof hydrogen and an aliphatic hydrocarbon radical, in the presence of a dehydration catalyst. No. 2,439,359. James K. Dixon and Elmer W. Cook (to American Cyanamid Co.).

Process for the simultaneous dimerization and reduction of acrylonitrile to adiponitrile in the presence of magnesium and mercuric chloride with active hydrogen produced by the reaction of said magnesium with a primary aliphatic monohydric alcohol. No. 2,439,308. Robert M. Leekley (to E. I. du Pont de Nemours & Co.).

Preparing benzotetronic acid by heating 3-acetylbenzotetronic acid with a strong mineral acid until the 3-acetyl group has been removed. No. 2,439,302. Martin E. Hultquist (to American Cyanamid Co.).

Isomerization of normal butane to isobutane. No. 2,439,301. Thomas B. Hudson and John D. Upham (Phillips Petroleum Co.).

Producing halogenated hydrocarbons containing fluorine and another halogen which comprises contacting a halongenated hydrocarbon containing a plurality of atoms of halogen other than fluorine with a fluorinating agent comprising anhydrous hydrofluoric acid and a minor proportion of titanium tetrafluoride. No. 2,439,300. Roger S. Hovey and Paul H. Carnell (to Phillips Petroleum Co.).

Method of preparing 1, 2, 3, 4-tetrachlorobenzene which comprises heating a mixture comprising (1) water, (2) a compound selected from the class consisting of tetrachlorphthalic acid and tetrachlorophthalic anhydride, said anhydride forming the corresponding tetrachlorophthalic acid in the presence of the water, and (3) an inorganic basic material, and thereafter isolating 1, 2, 3, 4-tetrachlorobenzene from the reaction mass. No. 2,439,237. William E. Cass (to General Electric Co.).

4, 7-Dithiadecane-1, 10-diol bis (2, 2, 3-trimethylbutanoate). No. 2,439,213. Henning Waldemar Jacobson (to E. I. du Pont de Nemours & Co.).

Para-acetylbenzyl compounds. No. 2,439,204. William S. Emerson (to Monsanto Chemical Co.).

Irradiating with light of wave length in the range 0.015 to 0.4 micron, a liquid reaction mixture of vinyl fluoride, thiolacetic acid and from 0.5 to 5% based on the thiolacetic acid of butyl disulfide and isolating beta-fluoroethyl thiolacetate. No. 2,439,203. Ellsworth Knowlton Ellingboe (to E. I. du Pont de Nemours & Co., Inc.).

Preparation of 1-nitro-3-alkylanthrapyridone compounds. No. 2,439,120. Charles V. Wilson (to Eastman Kodak Corp.).

Producing a 3-alkoxy-5-pyrazolone. No. 2,439,098. Henry D. Porter, Arnold Weissberger, Walter A. Gregory (to Eastman Kodak Co.).

Polymer of a B-cyanoacrylic acid amide, trans form. No. 2,-439,080. James A. Davies (to The Texas Co.).
Kodak Co.).

Gas mixtures in alkylation of aromatic hydrocarbons. No. 2,-439,080. Jomes A. Davies (to The Texas Co.).

Copolymer of dichlorostyrene, butadiene 1, 3 and piperylene. No. 2,439,076. Charles C. Clark (to The Mathieson Alkali Works, Inc.).

Production of ethylene. No. 2,439,023. Sam P. Robinson (to Phillips Petroleum Co.).

Alkali metal alcoholates by reaction of an anhydrous alcohol and an alkali metal amalgam. No. 2,438,963. George Lewis Cunningham, Richard Sewall Robinson (to The Mathieson Alkali Works, Inc.).

Gamma-acetyl pimelic acid and diesters thereof by hydrolyzing a r-diacyl pimelonitrile. No. 2,438,961. Albert B. Boese, Jr. (to Carbide and Carbon Chem. Corp.).

Separating benzene hexachloride isomers. No. 2,438,900. William Herbert Cooke, James Crosby Smart (to Imperial Chemical Industries Ltd.).

Hydrolyzing a 2-cyanoethyl dione-2, 4. No. 2,438,894. Albert B. Boese, Jr. (to Carbide and Carbon Chem. Corp.).

Lactonizing ribonic acid to ribonolactone in organic solvent, which solvent contains strong acid as catalyst for lactonization, solvent being lower aliphatic alcohol. No. 2,438,883. Leo A. Flexser (to Hoffman-La Roche, Inc.).

Treating composition containing member of group consisting of d-ribonic acid and d-ribono-lactone, comprises treating composition with organic solvent adding another organic solvent for said member having lesser solvent action therefor, removing initial solvent by distillation, recovering d-ribonolactone from concentrated residue. No. 2,438,882. Leo H. Sternbach (to Hoffman-La Roche, Inc.).

Epimerizing calcium d-arabonate, comprises heating aqueous solution of salt for time to effect epimerization. No. 2,438,881. Leo H. Sternbach (to Hoffman-La Roche, Inc.).

Production of thiophenal comprises reacting phenol with hydrogen sulfide in presence of activated bauxite catalyst at 550° C. at pressure above 400 p. s. i. No. 2,438,838. Seaver A. Ballard and De Loss E. Winkler (to Shell Development Co.).

2-carbalkoxy-3-keto-tetrahydrothiophene process. No. 2,438,808. Anthony William d'Aubigny Avison and John Wynne Haworth (to Hoffman-La Roche, Inc.).

2-carbalkoxy-3-keto-tetrahydrothiophene product and process. No. 2,438,807. Paul Karrer (to Hoffman-La Roche, Inc.).

Producing derived mono-carboxylic acids from aldehydes selected vanillin, orth-vanillin and syringaldehyde, improvement consists in reacting aldehyde with gold oxide in hot aqueous solution of alkali metal hydroxide. No. 2,438,789. Irwin A. Pearl (to Sulphite Products Corporation).

Substance selected form group consisting of tetralyl-6-acetonitrile, tetralyl-6-acetic acid, lower esters and alkali metal salts of acid, tetralyl-6-acetamide, tetralyl-6-methylithiocyanate and tetralyl-6-methyl isothiocyanate. No. 2,438,751. Franklin D. Jones (to American Chemical Paint Company).

Securing dehydrocorticosterone acetate comprises: treating reaction product containing dehydrocorticosterone acetate to remove water-soluble basic and acidic impurities, concentrating resulting crude partly purified neutral residue, etc. No. 2,438,715. Stewart M. Miller and Jacob van de Kamp (to Merck & Co.).

Production of toluene by catalytic cracking of monoalkyl benzenes. No. 2,438,570. William J. Mattox (Universal Oil Products Company).

Preparing tetrafluorosuccinic acid comprises breaking ring of tetrafluorodichlorocyclobutane by oxidation in alkaline solution for forming an alkaline salt of tetrafluorosuccinic acid, adding acid to react with alkaline metal of salt. No. 2,438,485. Albert L. Henne (to Ohio State University Research Foundation).

New class of compounds consisting of hexofluoroglutaric acid and alkaline salts thereof. No. 2,438,484. Albert L. Henne (to The Ohio State University Research Foundation).

Catalytic process for producing butadiene. No. 2,438,464. Le Roy U. Spence and Darrel J. Butterbaugh and Donald G. Kundiger (to RÖhm & Haas Company).

Separation of diolefins and contaminating hydrocarbons from rich ammoniacal aqueous solutions. No. 2,438,437. Ike D. Hall (to Standard Oil Development Company).

Isolation of oleandrin steps which comprise subjecting impure solution of oleandrin to action of lead acetate, etc. No. 2,438,418. August I. Ryer and Marie Frisch (to Schering Corporation).

Dehydrogenation and cyclization of 1,3 pentadiene to 1,3 cyclopentadiene comprises contacting 1,3 pentadiene with mass consisting of a porous adsorbent alumina. No. 2,438,404. Stanford J. Helzel and Robert M. Kennedy (to Sun Oil Co.).

Dehydrogenation and cyclization of 1,3 pentadiene to 1,3 cyclopentadiene comprises contacting 1,3 pentadiene with contact mass selected from subdivided iron and steel. No. 2,438,403. Robert M. Kennedy and Stanford J. Hetzel (to Sun Oil Co.).

Dehydrogenation and cyclization of 1,3 pentadiene to 1,3 cyclopentadiene comprises contacting 1,3 pentadiene with fused alumina. No. 2,438,402. Robert M. Kennedy and Stanford J. Hetzel (to Sun Oil Company).

Dehydrogenation and cyclization to 1,3 cyclopentadiene of 1,3 pentadiene comprises subjecting compound to dehydrogenation temperature in presence of contact mass consisting of silicon carbide. No. 2,438,401. Robert M. Kennedy and Stanford J. Helzel (to Sun Oil Company).

Dehydrogenation and cyclization of 1,3 pentadiene to 1,3 cyclopentadiene comprises contacting 1,3 pentadiene with mass consisting of chromic oxide on alumina. No. 2,438,400. Stanford J. Helzel and Robert M. Kennedy (to Sun Oil Co.).

Dehydrogenation and cyclization of 1,3 pentadiene to 1,3 cyclopentadiene comprises contacting 1,3 pentadiene with silica gel. No. 2,438,399. Robert M. Kennedy and Stanford J. Hetzel (to Sun Oil Company).

Manufacturing benzene ortho dicarboxylic acid anhydride by oxidation in vapor phase of mixture of aliphatic substituted benzenes having aliphatic radicals of 1 to 3 carbon atoms, etc. No. 2,438,369. Irving E. Levine (to California Research Corporation).

Recovering benzene of high degree of purity from impure benzene comprising: mixing under pressure impure benzene with mixture of solvents comprising propane and isopropyl alcohol, etc. No. 2,438,368. William O. Keeling (to Koppers Company, Inc.).

Production of unsaturated ketones comprises reacting olefinic hydrocarbon with material selected from acid halides of monocarboxylic acids having between 2 and 6 carbon atoms and acid halide producing mixtures consisting of polyvalent metal halide plus anhydride of monocarboxylic acid having between 2 and 6 carbon atoms. No. 2,438,334. Thomas F. Doumani and Joseph Francis Cuneo (to Union Oil Company of California).

Forming solidified composition including lactic acid. No. 2,438,326. Herman H. Schopmeyer (to American Maize-Products Company).

Dehydrogenation of 2,3-dimethylbutane. No. 2,438,315. Frederick E. Frey (to Phillips Petroleum Company).

Purification of acetic acid by azeotropic distillation. No. 2,438,300. Lester E. Schniepp (to United States of America).

Purifying methyl alpha-acetoxyproprionate contaminated with acetic anhydride comprising adding ethylcyclohexane, followed by distillation thereof. No. 2,438,278. Charles H. Fisher and Martin L. Fein (to United States of America).

Crystalline d-lysergic acid diethyl amide, which crystallizes from benzene in prisms melting with decomposition at 80-85° C. No. 2,438,259. Arthur Stoll and Albert Hofmann (to Sandoz Ltd.).

Metallation of beta-keto esters. No. 2,438,241. Vernon H. Wallingford and August H. Homeyer (to Mallinckrodt Chemical Works).

Manufacture of ethyl benzene comprises subjecting proportioned mixture of polyethyl benzene and benzene to reaction in contcat with phosphoric acid catalyst. No. 2,438,215. Valadimir N. Ipatieff and Louis Schmerling (to Universal Oil Products Company).

Continuous process of converting lactic acid to polylactic acid. No. 2,438,208. Edward M. Filachione and Charles H. Fisher (to United States of America).

N,N - bis - (3 - diethylaminopropylamide) of dicarboxylic acid, $R(COOH)_2$ where in R is polymethylene, — $(CH_2)n$ —, radical and n is integer from 4 to 8. No. 2,438,200. Lyell C. Behr and Richard S. Schreiber (to E. I. du Pont de Nemours & Company).

P—aminobenzenesulfonamido—substituted thiazolines and method for production. No. 2,438,177. William A. Lott and Frank H. Bergeim (to E. R. Squibb & Sons).

Manufacture of milled soap from mixture comprising water and soap which forms solid masses under normal atmospheric conditions and is selected from alkali metal, ammonium, and organic amine salts of higher fatty acids containing 10 to 20 carbon atoms, etc. No. 2,438,169. Lester Francis Hoyt (to Allied Chemical & Dye Corporation).

Production of methacrylic acid comprises contacting vaporous reactant mixture of chloretone and constant boiling aqueous hydrochloric acid with compound selected from phosphates and acid phosphates of heavy metals of subgroups 1,2,3, and 4 of the periodic table of elements and carrier supported phosphoric acid as catalytic agent. No. 2,438,164. George A. Harrington and Everett Gorin (to Socony-Vacuum Oil Co.).

Refining anthracene cake containing anthracene, carbazole and phenanthrene comprising: hydrogenating anthracene cake in presence of metallic sulfide hydrogenation catalyst to obtain maximum conversion of anthracene to 9,10-dihydroanthracene. No. 2,438,148. Ben Bennett Corson and Robert Sherman Detrick (to Koppers Company, Inc).

Stabilizing reaction mixture products by oxidation of alkyl-substituted aromatic organic compounds having structural formula described in patent. No. 2,438,125. Eugene J. Lorand and John E. Reese (to Hercules Powder Company).

New compounds 1,2-dihydrocarbon-substituted-3-cyanoguanidines having at least one aliphatic hydrocarbon substituent. No. 2,438,124. Hans Z. Lecher and Robert P. Parker and Robert S. Long (to American Cyanamid Company).

Canadian

Crystalline diisophorone. 449,161. Seavor A. Ballard and Vernon E. Haury (to Shell Development Company).

Tetraacylribonic acid. No. 449,139. Max Tishler (to Merck & Co., Inc.).

Preparation of a dihydroxy cholanic acid which comprises oxidizing a trihydroxy cholanic acid having a free hydroxyl group in the 7 position, to form an intermediate ketone-containing compound, and substantially completely reducing the ketone group. No. 449,113. Willard M. Hoehn and Alexander W. Schneider (to George A. Breon & Company).

Process for making purified lactic acid by esterifying lactic acid distilling the lactic acid ester, and fractionating, at the same tmie hydrolyzing the lactic acid ester. No. 449,109. Herman H. Shopmeyer and Charles R. Arnold (to American Maize-Products Company).

Producing sym-tetramethyl-ethylene glycol which comprises subjecting a solution of acetone in sulphuric acid to electrolysis in contact with a cathode of a base of metal of low hydrogen over-voltage coated with a thin layer of lead. No. 449,046. Thomas S. Chambers and Ober C. Slotterbeck (to Standard Oil Development Company).

Producing sulphamido-amino-pyridines comprising reacting an amino-acetaminopyridine with p-acetaminobenzenesulphonyl-chloride, hydrolyzing off the acetyl group with dilute acid precipitating the free base with an alkali, and purifying. No. 449,031. Edmond Thomas Tisza and Bernard Francis Duesel (to Nepera Chemical Co., Inc.).

Guanidine pentachlorphenate. No. 448,980. Vartkes Migrdichian (to American Cyanamid Co.)

Producing biguanide and alkyl substituted biguanides by subjecting copper biguanide sulphate to the action of an alkali metal sulphide. No. 448,978. Russell L. Sperry and Edwin O. Hook (to American Cyanamid Company).

Preparing a complex addition compound of diorthotolyl guanidine and zinc chloride. No. 448,977. Arnold R. Davis (to American Cyanamid Co.).

Products of the following formula: $RCOO(CHR')_x$-Hal wherein x equals at least 2, R is an alkyl radical having at least 10 carbon atoms, and R' is a member of the group consisting of hydrogen and lower alkyl radicals, with an alipahtic polyamine having at least 2 amino groups of the class consisting of primary and secondary amino groups. No. 448,976. David W. Jayne, Jr. and Harold M. Day (to American Cyanamid Company).

a-n-amyl cinnamal ethyl cyanoacetate. No. 448,975. Ingenuin Hechenbleikner (to American Cyanamid Company).

Benzal octyl cyanoacetate. No. 448,974. Ingenuin Hechenbleikner (to American Cyanamid Co.).

Making guanidine nitrate by reacting dicyandiamide and ammonium nitrate. No. 448,972. David W. Jayne, Jr. and Louis L. Lento, Jr. (to American Cyanamid Co.).

Hydration of phthalic anhydride. No. 448,970. Edwin Austin Gaskill, Jr. (to The Barrett Company).

Producing 1,3 butadiene passing ethanol over a catalyst comprising magnesium oxide and silica. No. 448,963. Waclaw Szuflewicz.

Making acrylonitrile by reacting acetylene and hydrogen cyanide in the presence of a metal from the group consisting of cadmium, magnesium and zinc. No. 448,891. LeRoy U. Spence, Darrel J. Butterbaugh and Edwin H. Kroeker (to Rohm & Haas Company).

Making low molecular weight distillable organic compounds from lignin by treating with water, sodium alkaline solution and a partially water-immiscible lower primary aliphatic alcohol. No. 448,881. Jorgen Richter Salvesen, Ralph L. Hossfeld and Robert J. Lovin (to Marathon Corp.).

Production of nitroparaffins by treating at elevated temperature

a catalyst consisting of substantially pure metallic aluminium with gaseous nitrogen peroxide, subsequently heating in the gaseous phase nitrogen peroxide and at least one paraffin hydrocarbon. No. 448,861. Kenneth William Gee, to Canada Industries Limited).

Compounds of the group consisting of 1,3-dicyanoguanidine and salts of 1,3-dicyanoguanidine. No. 448,841. Donald W. Kaiser and Jack T. Thurston (to American Cyanamid Company).

Preaparing guanylthioures sulphate by heating 2-thio-4,6-diamino-1,3,5-thiadiazine, water and sulphuric acid. No. 448,-840. Jack T. Thurston and Russell L. Sperry (to American Cyanamid Company).

Preparing N,N'-diarylamidines by mixing a primary aromatic amine, a carboxylic acyl dicyandiamide and an acid having a dissociation constant of at least 1 x 10^{-5}. No. 448,839. Jack T. Thurston, Daniel E. Nagy (to American Cyanamid Co.).

Producing N^1-aryl sulphonamides by reacting a p-substituted benzenesulphone halide with an amino-phenol having at least one substituent consisting of alkyl radicals and alkoxy radicals. No. 448,838. Moses Leverock Crossley (to American Cyanamid Company).

A process for reacting ethylene with nitrogen tetroxide in the presence of oxygen. No. 448,719. Arthur Ernest Wilder Smith and Charles William Scaife (to Imperial Chemical Industries Limited).

A process for the production of vinyl cyanide which comprises reacting hydrocyanic acid with acetylene in the vapour phase in the presence of water vapour. No. 448,693. Howard Donovan Green, Donald Stison Taylor (to Canadian Industries Ltd.).

Production of alpha-nitro-isobutene which comprises trating 1. 2-dinitro-isobutane in the presence of water with at least one basic substance. No. 448,691. Arthur Ernest Wilder Smith and Charles William Scaife (to Canadian Industries Limited).

Reaction product of an alkaline thiosulphate and a saturated macromolecular organic compound having at least one recurring unit linked together in chainlike fashion in the molecule, an average molecular weight in excess of 1000, and a reactive ester group. No. 448,688. Emmette Farr Izard (to Canadian Industries Limited).

Isothiourea derivative of a macromolecular organic compound having at least one recurring unit linked together in chain-like fashion in the molecule, an average molecular weight in excess of 1000, and at least one reactive ester group in which the isothiourea group is attached through the sulphur atom. No. 448,687. Emmette Farr Izard and Benjamin Wilson Howk (to Canadian Industries Limited).

Production of vinyl cyanide by reacting hdrocyanic acid with acetylene in the vapour phase. No. 448,685. Charles Roberts Harris (to Canadian Industries Limited).

Preparation of a-nitro-isobutene by reacting dinitro-isobutane with an aliphatic alcohol. No. 448,684. Arthur Ernest Wilder Smith, Rober Holroyd Stanley and Charles William Scaife (to Canadian Industries Limited).

Preparation of nitroethylene by reacting with an alcohol and a substance from the group 1:2-dinitroethane, B-nitroethyl nitrate. No. 488,678. Arthur Ernest Wilder Smith, Robert Holroyd Stanley and Charles William Scaife (to Canadian Industries Limited).

Manufacture of sulphanilyl guanidine which comprises causing dicyanodiamide to interact with a 4-acylamino-benzenesulphonamide. No. 448,677. Ernest Haworth and Francis Leslie Rose (to Imperial Chemical Industries Limited).

Process for the preparation of 1,2-dinitroethane which comprises adding ethylene to liquid nitrogen tetroxide. No. 448,-676. Arthur Ernest Wilder Smith (to Imperial Chemical Industries Limited).

Preparation of products having the structural formula $(HOCH_2CH_2)(OCH_2OCH_2CH_2)x(OCH_2OCH_2CH_2OH)$ in which x is a positive integer from 1 to 2, by reacting ethylene glycol with formaldehyde. No. 448,675. William Franklin Gresham (to Canadian Industries Limited).

Process for the nitration of aromatic hydrocarbons. No. 448,673. James Bertrand Castner (to Canadian Industries Limited).

Process of distilling tar to produce a heavy creosote oil having a low coke residue. No. 448,661. Joseph Zavertnik (to The Barrett Company).

Reacting a copper salt with a solution of a thiourea N-substituted by at least one phenyl group. No. 448,625. Max Bockmuhl and Walter Persch.

Manufacture of sulphonic acid amide compounds by reacting upon an aminoaryl compound which is substituted by at least one acid group with a paraacylaminobenzene sulphonic acid halide. No. 448,617. Robert Behnisch, Josef Klarer and Fritz Mietzch (to Winthrop Chemical Co., Inc.).

Stabilizing and improving the odour of an aliphatic alcohol prepared by the treatment of olefin with sulphuric acid by contacting the alcohol with small amounts of cuprous chloride. No. 448,599. Rudolph J. Oxol and Christopher R. Masterson (to Standard Alcohol Company).

Producing dibenzthiazyl disulphide by electrolyzing an aqueous solution of a sodium salt of mercaptobenzthiazole. No. 448,-586. John Albert Gardner (to Monsanto Chemicals Limited).

Manufacture of carbon black. No. 448,566. William B. Wiegand and Harold A. Braendle (to Columbian Carbon Company).

Amidine salt of aminobenzoic acid. No. 448,530. Garnet Philip Ham (to American Cyanamid Company).

Packaging

Paperboard container. No. 2,438,982. Marshall I. Williamson (to National Folding Box Co.).

Manufacture of cardboard boxes. No. 2,438,509. Henry P. McGovern (to Dennison Manufacturing Company).

Paints, Pigments

Preparing a composite pigment by dissolving from 5 to 75% of pigments of the halogenated isodibenzanthrone class and 95 to 25% of blue tetrabenzotetrazaporphine pigments in concentrated sulfuric acid and coprecipitating a composite pigment by diluting the mixture with water. No. 2,439,222. Mario Scalera, Robert E. Brouillard (to American Cyanamid Co.).

Paper, Pulp

Canadian

Paper of uniformly distributed cellulosic fibres bonded together



by the union of gelatinized surfaces of the fibres. No. 449,003. Maurice A. Goldman (to Fibre Products Laboratories Inc., Saco-Lowell Shops, and Chicopee Manufacturing Corp.).

Method for production of wet-strength paper which comprises adding to paper stock prior to its formation a water-soluble, thermosetting resinous product obtained by reacting by condensing an aldehyde from the group consisting of formaldehyde-acetaldehyde, butyraldehyde, furfuraldehyde, and benzaldehyde, a carbamide and guanadine. No. 448,750. Robert W. Auten and George V. N. Morin (to The Resinous Products & Chemical Company).

Paper containing a fire inhibiting salt, asphalt, and wax. No. 448,590. Edward Hugo Voigtman and John Calvin Bletzinger (to Paper Patents Company).

Process for wax sizing paper fibres which comprises suspending the fibre in water and heating to a temperature sufficiently high to melt wax, adding wax heating the wax and fibre until the wax has completely melted and mixed with the fibre and adding ethanol ethylene diamine monostearamide to fix the wax on the fibres. No. 448,588. Laurence R. Sherman (to National Oil Products Company).

Petroleum

Improved lubricant comprising a lubricating oil and as an oxidation inhibitor, an unsubstituted alkyl sulfenamide. No. 2,439,734. Chester M. Himel and Grant C. Bailey (to Phillips Petroleum Company).

Cracking process to produce gaseous olefins. No. 2,439,730. John Happel (to Socony-Vacuum Oil Company).

Manufacture of oils by introducing ethylene into a stirred suspension of an aluminum chloride catalyst in a mixture of naphthalene with at least one substance selected from the group consisting of benzene, ethylbenzenes, benzene higher homologues and ethylbenzene higher homologues. No. 2,439,729. Henri Martin Guinot and Armand Courtier (to Les Usines de Melle).

Organic hydrocarbon composition stabilized with a sulfurized homopolymer of an alkyl substituted 1,3-pentadiene. No. 2,439,610. Rupert C. Morris and John L. Van Winkle and Alva V. Snider (to Shell Development Company).

Manufacture of motor fuel by alkylation with a light cracked naphtha. No. 2,439,600. Arthur R. Goldsby and Louis A. Clarke (to The Texas Company).

Separating a hydrocarbon mixture which comprises extracting the hydrocarbon mixture with an aliphatic cyano compound formed by reacting acrylonitrile with a compound selected from the class consisting of the mono- and polyethylene amines, and the monomethyl and monoethyl ethers of ethylene glycol, of diethylene glycol and of tri-ethylene glycol. No. 2,439,534. Benjamin G. Wilkes, Jr. (to Carbide and Carbon Chemicals Corporation).

Method for conversion of gaseous and high boiling liquid hydrocarbon charges in the presence of a moving contact material. No. 2,439,372. Thomas P. Simpson (to Socony-Vacuum Oil Co.).

Method for the conversion of hydrocarbons in the presence of a particle from solid contact mass material. No. 2,439,348. Thomas P. Simpson and Russell Lee and Frederick E. Ray (to Socony-Vacuum Oil Co.).

Diaryl paraffins by a process which comprises condensing a hydrocarbon of the benzene series containing at least one hydrocarbon substituent with a saturated aliphatic aldehyde having at least 2, carbon atoms in the presence of hydrogen fluoride. No. 2,439,228. Murray Gray Sturrock, Thomas Lawe and Woodrow Ernest Kemp (to Dominion Tar & Chemical Co., Ltd.).

Preparation of saturated hydrocarbons from olefins. No. 2,439,021. Harold T. Quigg (to Phillips Petroleum Co.).

Improved mineral oil composition comprising mineral oil having admixed therewith minor proportion, to stabilize against oxidation, of metal salt of diaryl sufide of alkyl-substituted diaryl dithiophosphoric acid. No. 2,438,876. Orland M. Reiff and Harry J. Andress, Jr. (to Socony-Vacuum Oil Company).

Recovering asphalt in form readily dispersed in crude petroleum. No. 2,438,874. Jacob R. Meadow and Ebenezer Emmet Reid (to Socony-Vacuum Oil Company).

Alkylation of paraffin having tertiary carbon atom in molecule with alkylating agent in presence of alkylation catalyst. No. 2,438,852. Arthur R. Goldsby and Claude W. Watson (to The Texas Company).

Liquefying solids deposited from petroleum, in which deposits are treated with mixture consisting of chemical selected from sodium hydroxide and potassium hydroxide. Representing from 10% to 90% of mixture, phenol representing from 90% to 10%. No. 2,438,682. Pearlie B. Roberts.

Composition of matter comprising admixture of hydrocarbon lubricating oil base admixed with minor amounts to impart E. P. properties to lubricant of chlor phenalkyl ester. No. 2,438,599. Edward S. Blake (to Monsanto Chemical Company).

Purifying hydrocarbon material containing small amount of organic fluorine compound. No. 2,438,565. Carl B. Linn and Juliam M. Mavity (to Universal Oil Products Company).

Oil composition having high resistance against oxidation comprising petroleum oil boiling in lubrication oil range and small amount, to inhibit deterioration, of tertiary butyl ether of 4-isopropyl alpha naphthol. No. 2,438,468. Jones I. Wasson and Carroll J. Wilson (to Standard Oil Development Co.).

Catalytic conversion of hydrocarbons. No. 2,438,467. Charles W. Tyson, Herbert G. M. Fischer and Eger V. Murphree (to Standard Oil Development Company).

Catalytic conversion of relatively heavier hydrocarbon oils to more volatile motor fuels and gaseous products. No. 2,438,456. Robert P. Russell, Eger V. Murphree and Charles E. Hemminger (to Standard Oil Development Company).

Producing hydrocarbons and oxygenated organic compounds. No. 2,438,449. Max A. Mosesman (to Standard Oil Development Company).

Lubricant and hydraulic fluid composition. No. 2,438,446. Hollis L. Leland (to Standard Oil Development Company).

Acid-treating of catalytically cracked naphtha. No. 2,438,445. Arnold F. Kaulakis (to Standard Oil Development Company).

Conversion of heavy residual oils into lower boiling hydrocarbons. No. 2,438,439. Charles E. Hemminger (to Standard Oil Development Company).

Continuous method for isomerizing normal paraffin hydrocarbons normally free from naphthene hydrocarbons. No. 2,438,421. Eugene E. Sensel, William R. Smith and Arthur R. Goldshy (to The Texas Company).

Low temperature polymerization of olefinic hydrocarbons. No. 2,438,340. Herbert L. Johnson (to Sun Oil Company).

Conversion of high boiling fluid hydrocarbons to lower boiling gaseous hydrocarbon products in presence of moving particle-form contact material. No. 2,438,261. Ernest Utterback (to Socony-Vacuum Oil Company).

Process using aluminum bromide-hydrocarbon complex to promote alkylation of aromatic hydrocarbons by olefins of more than two carbon atoms per molecule. No. 2,438,211. Manuel H. Gorin and Lorld G. Sharp (to Socony-Vacuum Oil Co.).

Canadian

Polymerizing substances contained in cracked gasoline to reduce the gum content. No. 449,027. John Joseph Allinson, John Ward Poole and Francis Ralph Grant (to Lion Oil Refining Co.).

A hydrocarbon oil and an oil miscible hydroxy aromatic compound in which the hydroxy hydrogen has been replaced by metal and the nuclear hydrogen by a mineral oil solubilizing substituent. No. 448,991. Elmslie William Gardiner and George Hiagh Denison, Jr. (to Standard Oil Company of California).

A solvent extraction process comprising contacting said mixture with a hydrocarbon-substituted liquid sulpholane. No. 448,898. Gino J. Pierotti and Clarence L. Dunn (to Shell Development Company).

Separating a mixture of hydrocarbons comprising diolefins and more saturated hydrocarbons with a sulpholane. No. 448,897. Theodore W. Evans and Rupert C. Morris (to Shell Development Company).

Apparatus for heat treating oil shale and other finely divided materials. No. 448,889. William O. Pray (to Pray Research Corp.).

Process for producing blown asphalts by air-blowing a high molecular weight petroleum hydrocarbon in the presence of a phosphorous catalyst. No. 448,738. Arnold John Hoiberg (to Lion Oil Co.).

Method of clay-treating cracked gasoline in the vapour phase. No. 448,737. John Joseph Allinson, John Ward Poole and Francis Ralph Grant (to Lion Oil Refining Company).

In a process of making asphalt incorporating in the residuum a small amount of zirconium halide and a small amount of a hydrohalogen acid. No. 448,605. Robert E. Burk and Charles H. Whitacre (to The Standard Oil Company).

Diesel engine lubricant comprising a naphthenic base mineral oil and an isobutylene polymer. No. 448,604. Edward R. Barnard (to Standard Oil Co.).

Diesel engine lubricant comprising a paraffinic lubricating oil and an iso-olefin polymer. No. 448,603. Maurice H. Arveson (to Standard Oil Co.).

Converting a paraffin hydrocarbon within the range of pentane to octane to an isomer of higher octane number by the action of an aluminum halide catalyst in the presence of an added hydrogen halide activator. No. 448,602. Edmond L. d'Ouville and Bernard L. Evering (to Standard Oil Company).

Photographic

Color-forming photographic developer comprising a primary aromatic amino developing agent and a coupler compound having the formula R—$COCH_2CONHCO$—R′. Where R is selected from the class consisting of aryl and benzofuroyl radicals and R′ is selected from the class consisting of alkyl and aryl radicals. No. 2,439,352. Arnold Weissberger and Henry D. Porter (to Eastman Kodak Co.).

Photographic silver-halide emulsions containing 1,3,4-triazaindolizine cyanine dyes. No. 2,439,210. Newton Heimbach (to General Aniline & Film Corp.).

Photographic material comprising silver halide gelatine emulsion in contact with member of the group consisting of sulfinic acid, seleninic acid and their salts, and cystine compound selected from group consisting of compounds having formulae described in patent. No. 2,438,716. Fritz W. H. Mueller (to General Aniline & Film Corporation).

Bleaching bath and process for bleaching color film. No. 22,977. Frank J. Kaszuba (to General Aniline & Film Corporation).

Canadian

Process of producing azine photographic dyestuff images. No. 448,576. Vsevolod Tulagen (to General Aniline & Film Corp.).

Polymers

Process of forming hollow articles from oriented polymer. No. 2,439,716. Robert W. Canfield and Fred E. Wiley and Antone Mr. Guerreiro (to Plax Corporation).

Process of improving the craze-resistance of a methylopolysiloxane resin by passing chlorine into a solution of a methylpolysiloxane resin. No. 2,439,669. Birger W. Nordlander (to General Electric Company).

Polymerization of mono-olefin in the presence of 0.001 to 5% of an azine catalyst having the formular $R_2C{=}N{-}N{=}CR_2$ in which R of each R_2 group is a member of the class consisting of hydrogen, alkl, alkaryl and aryl groups; the other R of the same R_2 group is a member of the class consisting of alkyl, alkaryl, and aryl groups. No. 2,439,528. Milton J. Roedel (to E. I. du Pont de Nemours & Company).

Polymerised methyl meth, crylate opaque to X-rays having incorporated ethylene dibromide. No. 2,439,374. Sidney Arthur Leader and James Joseph Gordon (to Portland Plastics Ltd.).

Liquid copolymer of B-myrcene and p-methyl styrene in a weight ratio of 3:1. B-myrcene to p-methyl styrene. No. 2,439,343. Edward L. Kropa (to American Cyanamid Co.).

Ternary interpolymers of styrene, maleic anhydride, and acryloni-trile. No. 2,439,227. Raymond B. Seymour and John P. Kispersky (to Monsanto Chemical Co.).

Solid resinous consisting of the interpolymer of a mixture of 5% to 40% by weight of fumarodinitrile and the remainder consisting of a compound of the group of alphasubstituted styrenes consisting of alpha-methyl-styrene, alpha-para-dimethylstyrene and alpha-phenylstyrene. No. 2,439,226. Raymond B. Seymour (to Monsanto Chemical Co.).

Interpolymer of 5-95% of a phosphonic compound of the class consisting of dialkyl esters, diaryl esters and tetraalkyldiamides of alkene phophonic acids in which acids the phosphorous is bonded to carbon of an alkenyl radical, said second carbon of said radical, and 95-5% of a comonomer of the class

consisting of alkyl methacrylates, methyl acrylate, styrene, ethylene, acrylonitrile, vinyl chloride, vinyl acetate and vinylidene chloride. No. 2,439,214. Richard Vernon Lindsey, Jr. (to E. I. du Pont de Nemours & Co.).

Resinous material consisting of the interpolymer of 58% para-chloro-alpha-methylstyrene and 42% styrene. No. 2,439,213. John Paul Kispersky and Raymond B. Seymour (to Monsanto Chemical Co.).

Laminated plastic article. No. 2,439,137. Auguste V. Keller (to Thompson's Ltd.).

Coating with polyvinyl alcohol. No. 2,439,108. Henry C. Stachle (to Eastman Kodak Co.).

Electric insulation composition of polyvinyl chloride and polyalkylene polysulfide. No. 2,438,494. Thomas Robertson Scott and Archibald Alan New (to Standard Telephones and Cables Ltd.).

Oriented polymeric sheath. No. 2,438,901. Charles D. Coxe.

Blowing toy balloons from plastic momposition of polyvinyl acetate dissolved in volatile organic solvent. No. 2,438,854. Jens Gunner Pakobsen (to Niels B. Bach).

Copolymers of tetraallylsilane. No. 2,438,612. Charles A. MacKenzie and John B. Rust (to Montclair Research Corporation and Ellis-Foster Company).

Organic resinous silicon polymer having monomeric formula (RO)n Si (OH)4-n being polymer of organic oxy silicol. No. 2,438,520. Norman P. Robie and Fred E. Sheibley (to The Carborundum Company).

Polystyrene electric insulating materials. No. 2,438,516. Archibald Alan New (to International Standard Electric Corp.).

Destroying peroxide-containing catalyst residues in alcohol-insoluble polymer containing member of class of vinyl halides and vinylidene halides polymerized therein. No. 2,438,480. George W. Stanton (to The Dow Chemical Company).

Polymer of dimethyl silicone having formula $[(CH_3)_2SiO]n$ where n represents an integer from 3 to 4 inclusive. No. 2,438,-478. James Franklin Hyde (to Corning Glass Works).

Canadian

A molding composition comprising the finely subdivided exchange compound and an ionizable salt of a polymerizable olefinic carboxylic acid, said compound containing the polymerizable olefinic group of said salt. No. 449,158. Ernst A. Hauser and Eli Mercer Dannenberg (to Research Corporation).

Treatment of crystalline vinylidene chloride polymer. No. 449,-124. Ernest H. Harder (to Dow Chemical Co.).

Synthetic resinous composition by reacting a —C=O-containing organic compound selected from the class consisting of aldehydes and ketones with (1) a hydrolyzed, thermoplastic polymer of a vinyl ester of a monocarboxylic acid, and (2) a 1-substituted guanazole. No. 449,121. Gaetano F. D'Alelio (to Canadian General Electric Company).

Resinous composition comprising the product of reaction of melamine, formaldehyde and an acetylhydrazino diamino pyrimidine. No. 449,119. Gaetano F. D'Alelio and James W. Underwood (to Canadian General Electric Company, Limited).

Continuous process for making a granulated aminoplast resin. No. 448,929. Leonard Smidth.

Producing high molecular weight heteropolymers of sulphur dioxide and olefins by reacting olefins with sulphur dioxide in the presence of a salt of monovalent copper. No. 448,888. Frederick E. Frey (to Phillips Petroleum Co.).

Producing high molecular weight heteropolymers of sulphur dioxide and olefins by reacting sulphur dioxide with an olefin in the presence of a small quantity of an oxide of nitrogen. No. 448,887. Frederick E. Frey (to Phillips Petroleum Co.).

Vinyl polymerization catalyst comprising a water soluble heavy metal salt in combination with a naturally occurring compound containing a cyclopentenophenanthrene ring having a substituent containing no elements other than oxygen and hydrogen at the C_3 position, a substituent containing no elements other than carbon, hydrogen and oxygen at the C_{17} position and no substituents containing elements other than carbon, hydrogen and oxygen at other positions. No. 448,874. William D. Stewart (to The B. F. Goodrich Company).

An electrical insulating substance comprising polymerized styrene having a molecular weight of about 80,000 to 120,000, about 30 per cent of polymerized styrene having a molecular weight of about 6,000 to 20,000, and about 20 per cent of plasticizer. No. 448,727. Arthur James Warner and Myron Bakst (to International Standard Electric Corp.).

A polyvinyl alcohol article containing as a plasticizer, an amine adduct of butadiene cyclic sulphone. No. 448,696. Carl Walter Mortenson (to Canadian Industries Limited).

A composition of matter consisting of a normally solid homopolymer of ethylene and from 0.001 per cent to 5.0 per cent by weight of diphenylamineacetone condensation product. No. 448,690. Daniel Eugene Strain (to Canadian Industries Ltd.).

Adhesive composition adapted for joining cellulosic surfaces, comprising a polyvinyl resin consisting of the soluble partial reaction product of a mixture of a linear polymeric polycarboxylic acid and a 37 per cent to 77 per cent hydrolyzed polyvinyl acetate. No. 448,682. Lee Landis Blyler, John Waldo Clough, Charles Wirt Hawley and Earle Carver Pitman (to Canadian Industries Limited).

Production of toluenesoluble polyvinyl chloride. No. 448,679. Patrick William Denny (to Canadian Industries Limited).

Processes and Methods

Process of making hydrophilic carbon black. No. 2,439,442. Fred H. Amon and Fred S. Thornhill (to Godfrey L. Cabot, Inc.).

Apparatus for producing mist of fine liquid particles suspended in gas, includes container for body of liquid and atomizer nozzle arranged to direct stream of gas containing atomized liquid vertically downward against surface of body of liquid, foraminous splash arrestor shield surrounding stream of gas and atomized liquid. No. 2,438,868. Vernon Anthony Trier.

Rubber

Complete thermoplastic homogeneous mixture of a normally elastic rubbery copolymer of butadiene-1,3 and acrylonitrile and a hard normally inelastic resinous thermoplastic copolymer of monomers consisting essentially of from 50 to 85% by weight of styrene and correspondingly from 50 to 15% by weight of acrylonitrile in proportions of 25 to 90% by weight of said resinous copolymer and 75 to 10% by weight of rubbery copolymer. No. 2,439,202. Lawrence E. Daly (to United States Rubber Co.).

Plasticized composition comprising butadiene-acrylonitrile emulsion interpolymer and naphthenic acid ester of petroleum phenols. No. 2,438,753. Henry B. Kellog (to Jasco, Incorporated).

Canadian

Process of making **vulcanizates of butadiene-styrene copolymer** by compounding the copolymer with vulcanizing agent, paracoumarone resin and metal oxide filler selected form the group consisting of aluminum oxide, iron oxide, titanium dioxide, and zinc oxide. No. 449,104. Theodore A. Bulifant (to Allied Chemical & Dye Corporation).

Composite products of rubber and rayon by applying a vulcanizable rubber composition to an assemblage of yarns formed from viscose containing casein. No. 448,867. James William Illingworth (to Dunlop Tire and Rubber Goods Company Ltd.).

Specialties

Boiling out steam boilers prior to placing them in operation which comprises circulating through the boiler a heated aqueous alkaline cleaning solution. No. 2,439,784. Wendell W. Cerna (to Hall Laboratories, Inc.).

Method of rendering glass water repellent which comprises dissolving an alkyl silicon trichloride in a volatile solvent to form a dilute solution applying the solution to the glass and thereafter heating the glass at a temperature of at least 110° C. No. 2,439,689. James Franklin Hyde (to Corning Glass Works).

Pressure-sensitive adhesive sheet material comprising a flexible sheet backing, an exposed coating of a normally tacky pressure-sensitive polybutene adhesive adherently affixed to one side of said backing and a substance, selected from the group consisting of water-insoluble metallic salts and amides of a saturated fatty acid. No. 2,439,481. John B. Martin (to The Kendall Co.).

Preparation for treating launderable fabric articles. No. 2,439,-460. Herman Engler (to Paul Koletzko and C. Alfred Hands).

Making a disinfecting cement by mixing a disinfectant agent composed of a polyhalogenated phenol and a copper compound with the cement clinkers prior to their grinding. No. 2,439,-441. Charles Rhodimer Amberg and William John Knapp (to North American Cement Corp.).

Fire-resistant composition for treating yarn, comprising 10 lbs. of a material from the group consisting of polyvinyl chloride and vinyl chloridevinyl acetate copolymer, 30 lbs. acetone, 6 lbs. zinc carbonate, 2.1 lbs. chromium, 9.3 lbs. mineral spirits and ½ lb. zinc naththenate. No. 2,439,396. Martin Leatherman.

Composition for rendering fabric rot- and fire-resistant comprising 15 lbs. vinyl acetate vinylfi chloride copolymer, 5 lbs. butyl methacrylate polymer, 10 lbs. tricresyl phosphate, 5.8 lbs. zinc carbonate, 27 lbs. acetone, 27 lbs. of a solvent consisting mainly of aromatic compounds 8.7 lbs. mineral spirits, 4.2 lbs. inert pigment, and ½ lb. pentachlorphenol. No. 2,439,395. Martin Leatherman.

Press-stable news ink comprising pigment dispersed in a vehicle consisting essentially of 20% to 40% of limed rosin containing 6% to 8% of calcium, a news ink oil from 1 to 2 times the weight of the rosin, and from 20 to 50% of kerosene. No. 2,439,380. Everett F. Carman and Otto P. Berberich (to Interchemical Corp.).

Press-stable news ink comprising pigment dispersed in a vehicle consisting essentially of 20% to 40% of Utah coal resin, from 1 to 2 times its weight of a news ink oil, and from 20% to 50% of kerosene. No. 2,439,378. Otto P. Berberich (to Interchemical Corp.).

Silk treatment which comprises subjecting silk to a treatment in an aqueous bath consisting of a mineral on emulsion, a small amount of the sodium salt of monoglyceryl-lauryl sulphate, a small amount of sulphonated castor oil and sufficient acetic acid to adjust the pH value of said bath to about 3.45. No. 2,439,221. Ben W. Rowland and Douglas Fronmuller (to The Institute of Paper Chemistry).

Insecticide comprising a monoalkylated diphenylene monosulfide. No. 2,438,955. Sager Tryon, Peter La Roche de Benneville (to Allied Chemical & Dye Corp.).

Ink paste cartridge for ball-nib fountain pens. No. 2,438,786. David Pelton Moore (to Premium Merchandising Corporation).

Carroting fur fibers employing medium comprising nitric acid solution and hydrogen peroxide. No. 2,438,738. Albert Frank Bowles and Anthony J. Keegel (to Trinity Holding Corp.).

Chewing gum material containing stabilized glyceryl rosin ester and alkyl cellulose. No. 2,438,551. Edward P. Fenimore (to Bowman Gum, Inc.).

Composition of matter capable of forming stable aqueous emulsion comprising major portion of sodium hydroxide neutralized sulfonated extract of naphthenic type petroleum oil and metal salt of stearic acid to prevent foaming of emulsion. No. 2,438,461. Jere C. Showalter (to Standard Oil Development Company).

Insecticidal composition comprising as its principal toxic ingredient pyrethrum and benezene sulfonic acid amide from reduced nitrogen bases from petroleum. No. 2,438,370. Allen H. Lewis (to California Research Corporation).

Paving material comprising stony aggregate and salt of acylamidoamine containing at least 1 free amine group with freely water soluble acid. No. 2,438,318. James M. Johnson (to Nostrip Inc.).

Treating fresh untanned hide comprises soaking hide in water to increase its weight, freezing hide, contacting frozen hide with water-absorbing medium while hide is maintained under subfreezing conditions to dry hide by sublimation. No. 2,438,150. Wallace M. Cutler (to United Shoe Machinery Corporation).

Canadian

Adhesive comprising suspension cellulosic particles in an aqueous solution of a formaldehyde-ures reaction product. No. 449,026. William C. Dearing and Kenneth D. Meiser (to Plaskon Company Inc.).

Bright finish quenching bath consisting of alkali metal chloride, alkali metal uoride and zinc chloride. No. 448,818. Artemas F. Holden.

Trademarks of the Month

A Checklist of Chemical and Chemical Specialties Trademarks

489,979. Northern Laboratories, Manitowoc, Wis.; filed Aug. 4, 1947; insecticide; since June 17, 1944.

496,771. Eronel Laboratories, Los Angeles, Calif.; filed Feb. 18, 1946; resinous textile sizing; since Nov. 19, 1945.

499,556. Hovley & Dalby, Brawley, Calif.; filed Apr. 3, 1946; insecticide; since Apr. 1, 1942.

502,224. McCormick and Co., Inc., Baltimore, Md.; filed May 16, 1946; insecticides; since Mar. 1, 1946.

506,992. Dow Chemical Co., Midland, Mich.; filed Aug. 7, 1946; carboxymethyl cellulouse and sales; since Aug. 28, 1944.

508,850. John Lucas & Co., Inc., d/b/a Lucas Kil-Tone Co., Phila., Pa.; filed July 15, 1947; insecticidal and fungicidal plant spraying and powdering operations; since Jan. 11, 1915.

510,006. J. Berlage Co., Inc., New York, N. Y.; filed Oct. 1, 1946; methyl bromide for use as a fumigant and insecticide; since December 1945.

510,018. E. F. Drew & Co., Inc., New York, N. Y.; filed Oct. 1, 1946; detergent and cleaner; since Aug. 19, 1946.

513,668. Clyde L. McCoy, d/b/a Pyro-Penn Products Co., San Jose, Calif.; filed Dec. 4, 1946; liquid soap, waterless paste soap, powder soap; polish having a petroleum paraffin base; since Oct. 1, 1941.

513,673. Monsanto Chemical Co., St. Louis, Mo.; filed July 12, 1947; curling agent for wool fibers; since Oct. 10, 1946.

513,813. Diversey Corp., Chicago, Ill.; filed July 19, 1947; cleanser incidental water softening properties; since Jan. 22, 1925.

514,026. General Dyestuff Corp., New York, N. Y.; filed July 10, 1947; dyes and dyestuffs; since Sept. 24, 1946.

514,027. General Dyestuff Corp., New York, N. Y.; filed July 10, 1947; dyes and dyestuffs; since Sept. 20, 1946.

516,678. E. I. duPont de Nemours & Co., Wilmington, Del.; filed Jan. 31, 1947; insecticides, fungicides, seed disinfectants, and weed killing compounds; since Jan. 1, 1940.

517,198. Paisley Products, Inc., Chicago, Ill.; filed Feb. 8, 1947; chemical preparations for use as a wood impregnant and wood preservative; since 1907.

517,972. Central Ohio Supply Co., Columbus, Ohio; filed Feb. 24, 1947; water soluble powdered or granular detergent compound containing water softening properties; since March 1927.

518,942. E. F. Drew & Co., Inc., New York, N. Y.; filed Mar. 13, 1947; water-soluble oil base liquid detergent; since Feb. 1, 1947.

521,819. Pacific Coast Borax Co., Los Angeles, Calif.; filed Sept. 16, 1947; synthetic detergents; since Feb. 28, 1947.

523,122. Wyandotte Chemicals Corp., Wyandotte, Mich.; filed Sept. 23, 1947; glycols; since May 6, 1947.

525,303. Darworth, Inc., Simsbury, Conn.; filed July 1, 1947; toxic vapor producing material to be used as an insecticide; since June 11, 1947.

526,798. Publicker Industries, Inc., Phila., Pa.; filed July 5, 1947; ethyl acetate, butyl acetate, methanol, and denatured alcohol; since May 1, 1928.

527,290. Pure Oil Co., Chicago, Ill.; filed July 5, 1947; anti-freeze preservative; since Apr. 6, 1942.

528,728. Kelco Co., San Diego, Calif.; filed July 16, 1947; an algin product; since July 1930.

530,140. A. J. Wittenberg Corp., New York, N. Y.; filed July 31, 1947; gums and resins; since June 28, 1945.

530,266. Valentine Co., Seattle, Wash.; filed Aug. 1, 1947; chemical compounds for industrial cleaning purposes; since Nov. 1, 1924.

530,429. Quaker Chemical Products Corp., Conshohoken, Pa.; filed Aug. 4, 1947; esters, mixtures of estates or esters compounded with modifying agents; July 7, 1947.

531,791. Griffin Chemical Co., San Francisco, Calif.; filed Aug. 19, 1947; mixtures of petroleum alkyl sulfonates and polyhydric alcohols; since Apr. 11, 1947.

531,792. Griffin Chemical Co., San Francisco, Calif.; filed Aug. 19, 1947; petroleum sulfonates as emulsifiers and wetting agents; since July 10, 1940.

531,793. Griffin Chemical Co., San Francisco, Calif.; filed Aug. 19, 1947; polyhydric alcohol-fatty acid esters in liquid form; since July 11, 1946.

531,892. Cowles Detergent Co., Cleveland, Ohio, filed Aug. 20, 1947; water softener and soap regenerator; since Feb. 1946.

532,124. Cowles Detergent Co., Cleveland, Ohio; filed Aug. 22, 1947; soluble chemical compounds; since Feb. 6, 1926.

532,181. Virginia-Carolina Chemical Corp., Richmond, Va.; filed Aug. 22, 1947; synthetic protein fiber; since Aug. 19, 1947.

532,362. Stauffer Chemical Co., San Francisco, Calif.; filed Aug. 25, 1947; insecticides and sulfur; since July 1, 1930.

533,052. W. G. Reardon Lab. Inc., Port Chester, N. Y.; filed Sept. 2, 1947; rodenticide; since March 1928.

533,582. Commercial Solvents Corp., New York, N. Y.; filed Aug. 16, 1947; alcoholic solvent; since July 17, 1947.

535,364. American Cyanamid Co., New York, N. Y.; filed Sept. 23, 1947; parathion; since Sept. 15, 1947.

537,071. Odora Co., Inc., New York, N. Y.; filed Oct. 7, 1947; insecticides, and insect repellants; since Aug. 1, 1947.

537,074. Odora Co., Inc., New York, N. Y.; filed Oct. 7, 1947; deodorizer, insect repellant and insect sprays; since June 29, 1936.

539,898. Proctor and Gamble Co., Cincinnati, Ohio; filed Nov. 1, 1947; sudsing cleaner detergents; since Oct. 2, 1947.

541,028. Sandoz Chemical Works, Inc., New York, N. Y.; filed Nov. 13, 1947; chemical preparation used in the after-treatment of dyed fabrics; since July 1946.

542,152. Monsanto Chemical Co., St. Louis, Mo.; filed Nov. 24, 1947; herbicides; since Sept. 8, 1947.

542,303. Food Machinery Corp., San Jose, Calif.; filed Nov. 25, 1947; insecticides; since Sept. 24, 1947.

542,371. Thompson-Hayward Chemical Co., Kansas City, Mo.; filed Nov. 25, 1947; insecticides; since July 15, 1947.

543,035. Philadelphia Quartz Co., Phila., Pa.; filed Sept. 23, 1947; silicate of soda, either anhydrous, hydrated, or in solution; since Apr. 12, 1933.

543,037. Philadelphia Quartz Co., Phila., Pa.; filed Sept. 23, 1947; silicate of soda, either anhydrous, hydrated, or in solution; since Jan. 1, 1932.

Trademarks reproduced and described include those appearing in Official Gazette of U. S. Patent Office, April 20-May 18.

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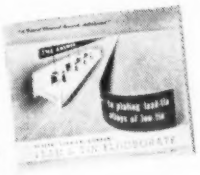
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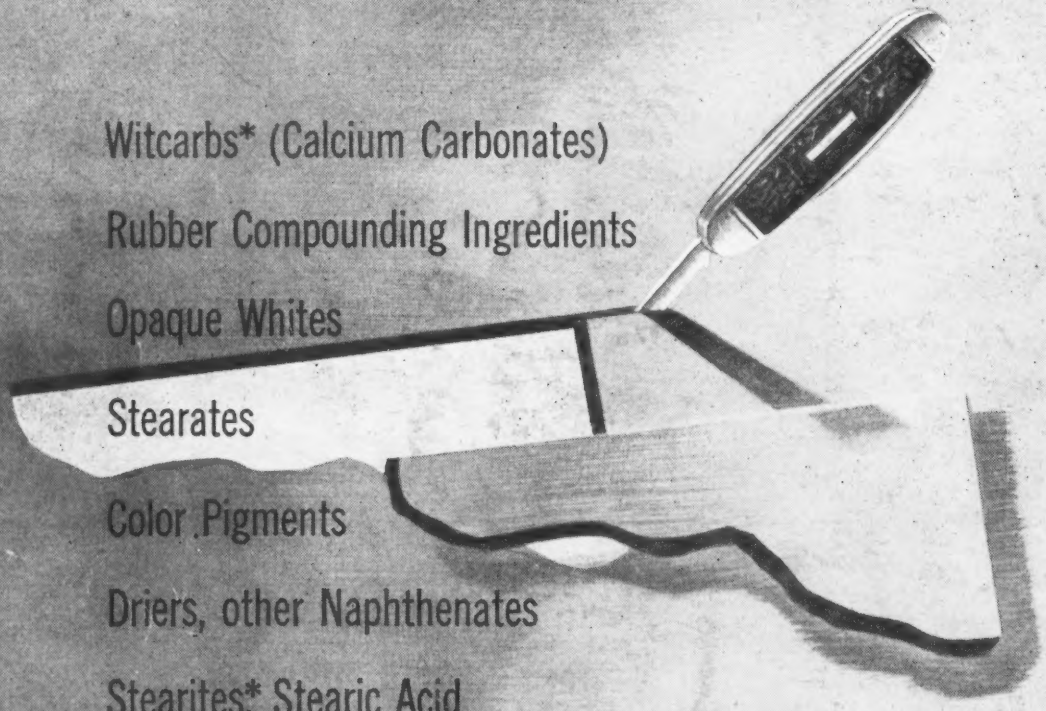
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